

ECOTOX

ECOTOXicology Database System

ECOTOX Code Appendix

Prepared for

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Appendix A. Carrier CAS Numbers

<u>Chemical Name</u>	<u>CAS #</u>
Acetate	71501
Acetic acid	64197
Acetone (2-Propanone)	67641
Acetonitrile	75058
Aerosol OT (Sodium salt)	577117
Agar	9002180
Arachis oil	8002037
Butyl dioxitol	112345
Benzene	71432
Cadmium Chloride	10108642
Cadmium Sulfate	10124364
Cod Liver Oil	8001692
Cottonseed Oil	8001294
Corn Oil	8001307
Cornstarch	9005258
Cyclosol 63	89072606
Diesel oil	68334305
1,4-Dioxane	123911
DMF, N,N-Dimethylformamide	68122
DMSO, Dimethyl Sulfoxide	67685
Emulphor	9004982
Ethanol (or Ethyl alcohol - absolute alcohol)	64175
Ether	60297
2-Ethoxyethanol	110805
Ethylene Glycol Monomethyl Ether (2-Methoxyethanol)	109864
Fish Oil	8016135
Fuel Oil	68476299
Gelatin	9000708
Gum acacia	9000015
Gum tragacanth	9000651
HCL, Hydrochloric Acid	7647010
Hexane (also, N-Hexane)	110543
HNO3, Nitric Acid (HNO3; H2SO4,R)-Purity Character (Sulphuric Acid,R)	7697372
Isopropanol (2-Propanol)	67630
Iron Sulfates	10124499
Lactose	63423
Methanol (Methyl alcohol) (CH3OH)	67561

Methoxyethanol (or 2-Methoxyethanol)	109864
Methylcellulose	9004675
Methylene Chloride	75092
Methyl ethyl ketone	78933
Mineral oil	8012951
NAHCO ₃ , Sodium Bicarbonate	144558
NAOH, Sodium Hydroxide	1310732
N,N-Dimethylformamide (or Dimethylformamide)	68122
Nitric Acid	7697372
Olive Oil	8001250
Peanut Oil	8002037
Pentane	109660
Petroleum ether	8030306
Polyethylene Glycol (2-Propanol)	25322683
Polysorbate 80 (Tween 80)	809005656
Potassium Hydroxide (KOH)	1310583
Propane (Propylene glycol)	57556
2-Propanol Isopropanol (or Isopropanol)-Isopropyl alcohol	67630
Propylene Glycol	57556
Safflower Oil	8001238
Saline	7647145
Salt	7647145
Sesame Seed Oil	8008740
Sodium Chloride (Salt, Saline)(Na Cl)	7647145
Sodium Sulfate	7757826
Soybean Oil	8001227
Starch	9005258
Sucrose	57501
Sulfuric Acid	7664939
Sunflower Oil	8001216
Tergitol NPX	9016459
Toluene (or Methylbenzene)	108883
Toxisol FLC	12738920
Trichloroacetic Acid	76039
Triethylene Glycol	112276
Trimethylene Glycol	504632
Trioctanoin	538238
Triton-X100	9002931
Tween 40	9005667
Tween 80 (Polysorbate 80)	9005656

Water	7732185
Vegetable oil	68956683
Velsicol	2307495
Xylene	1330207

Appendix B. Chemical Grade Codes

AASG	Atomic Absorption Spectrometry Grade	MRG	Merck Reagent Grade
ACS	American Chemical Society Grade	ME	Monsanto Electrical Grade
AG	Agricultural Grade	NAF*	National Formulary Grade
AN	Analar Grade	NP	Normapur Grade
AL	Analysis Grade	NR	Not Reported
A*	Analytical Grade	OP	Optima
A or GU	Analytical or Guaranteed Grade	PAN	Pestanal Grade
A or R	Analytical or Reagent Grade	PST	Pesticide Grade
A or T	Technical or Analytical Grade	PRG	Pesticide Residue Grade
AN or R	Analar or Reagent Grade	PH	Pharmaceutical Grade
AR*	A.R. Grade	PRA*	Practical Grade
B	Biological Grade	PR	Production Grade
CT	Certified Grade	PG*	Pure Grade
CG	Chemical Grade	PFG	Purified Grade
CH	Chromatographic Grade	R*	Reagent Grade
CL	Clinical Grade	RFG	Reference Grade
C	Commercial Grade	RE	Research Grade
C or AN	Commercial or Analar Grade	RE or A	Research or Analytical Grade
DG	Distilled in Glass Grade	RS	Residue Grade
DS	Dry Standard Grade	SC	Scintillation Grade
EM	Eastman Grade	SO	Solvent Grade
EL	Electrophoresis Grade	SPC	Spectrochemical Grade
EX	Experimental Grade	S	Spectrophotometric Grade
F	Field Grade	TA	Technical Acid Grade
FFL	Free flowing Grade	T*	Technical Grade
GR	GR Grade	T or P	Technical or Purified Grade
GU	Guaranteed Grade	T or PU	Technical or Pure Grade
GUR	Guaranteed Reagent Grade	TIS	Tissue Culture Grade
HPLC*	High Performance Liquid Chromatography Grade	ULV	ULV Grade
HG	Histological Grade	UP	Ultrapure Grade
I	Industrial Grade	USP*	United States Pharmacopeia Grade
L	Laboratory Grade	UV	Ultraviolet Grade
MK	Merck Grade	UVS	Uvasol Grade

* Code as "A" for concentration type for organic chemicals for AQUIRE

Appendix C. Chemical Formulation Codes

AE	Acid Equivalent	LD	Liquid
AI	Active Ingredient	LDCO	Liquid concentrate
ASG	Agricultural Suspension	MO	Miscible Oil
ARST	Analytical Reference Standard	N	Nanograde
AQ	Aqueous Solution	ND	Neutralized, Desensitized
AS	Aqueous Suspension	NF	Nonionized Form
AAPS	Atomic Absorption Primary Standard	NR	Not Reported
CP*	Chemically Pure	OD	Oil Dispersion
CRI	Chromatographically Impure	OS	Oil Soluble
CRP	Chromatographically Pure	ODA	Organic Dispersal Agent
C	Commercial	PAR	Particulate
CO	Concentrate	PEL	Pellet
CR	Controlled Release	PO	Powder
CRY	Crystal	PRE	Prepared in Lab
DC	Detached Crystals	PS *	Primary Standard
DG	Dispersable Granule (also known as "dry flowable")	PA	Pro Analsi Quality
DP	Dispersable Powder	PU	Pure, Purissium or Puris
D	Dust	PF *	Purified
EC	Emulsifiable Concentrate	RC	Recrystallized
EF	Emulsifiable Formulation	RST*	Reference Standard
ES	Emulsifiable Solution, Agent	RF	Registered Formulation
EG	Emulsified Granular	SRF	Slow Release Formulation
E	Emulsion	SD	Solid
EN	Encapsulated	S	Solution
FFO	Field Formulated	SO	Soluble Concentrate
FCASS	Fisher Certified Atomic Absorption Standard	SP	Soluble Powder
FK	Flake	SPCO	Spray Concentrate
FF	Flowable Formulation	SPL	Spray Liquid
FG	Finely Ground	SPO	Spray Powder
FO	Formulated	ST	Standard
GCR	Gas Chromatograph Standard	STD	Standard Solution for AA
GS	Gaseous	UD	Unneutralized, Desensitized
G	Granule, Granular	WMC	Water Miscible Concentrate
GU	Guaranteed	WS	Water Soluble
HG	Heavy Granular	WSC	Water Soluble Concentrate
		WP	Wettable Powder
		WHO	World Health Organization
		W/W	Weight per weight

* Code as "A" for concentration type for organic chemicals for AQUIRE

Appendix D. Radiolabel Isotope Codes

Ag-110	Silver	Ni-59	Nickel
Am-241	Americium	Ni-63	Nickel
As-74	Arsenic	Np-235	Neptunium
As-76	Arsenic	NR	Not Reported
Ba-133	Barium	P-32	Phosphorus
Be-7	Beryllium	Pb-210	Lead
C-12	Carbon	Pb-203	Lead
C-13	Carbon	Po-208	Polonium
C-14	Carbon	Po-210	Polonium
Cd-109	Cadmium	Pu-239	Plutonium
Cd-115	Cadmium	Pu-237	Plutonium
Ca-45	Calcium	Ra-226	Radium
Cl-36	Chlorine	Ru-106	Ruthenium
Cm-244	Curium	S-35	Sulfur
Co-60	Cobalt	Sb-125	Antimony
Co-64	Cobalt	Se-75	Selenium
Co-57	Cobalt	Sn-113	Tin
Cr-51	Chromium	Sr-90	Strontium
Cs-137	Cesium	Sr-85	Strontium
Cs-134	Cesium	Tc-95	Techninium
Cu-64	Copper	Tc-99	Technicium
Cu-63	Copper	Te-128	Tellurium
Cu-65	Copper	Tl-115	Thallium
Eu-152	Europium	Th-232	Thorium
F-18	Fluorine	Th 238	Thorium
I-131	Iodine	U-238	Uranium
Fe-59	Iron	U-232	Uranium
H-3	Hydrogen (Tritium)	U-235	Uranium
Hg-197	Mercury	V-48	Vanadium
Hg-203	Mercury	V-49	Vanadium
I-125	Iodine	Yes	Unknown radiolabel
I-131	Iodine	Zn-65	Zinc
Mn-54	Manganese		
N-15	Nitrogen		

Appendix E. Organism Source Codes

Code	Definition
CBC	C aptive b reeding c olony
COM	C ommercial source
DOM	D omestic strain
GAM	G ame farm strain
GOV	G overnment agency source
LAB	L aboratory strain
MLT	M ultiple Sources
NR	N ot reported
WLD	W ild strain

Appendix F. Lifestage Codes (at beginning of exposure)

I. Organism lifestage codes

Code	Definition
AD	Adult
AL	Alevin
BL	Blastula
CC	Cocoon
CO	Copepodid
CP	Copepodite
CS	Cleavage stage
CY	Cyst
EB	Eyed embryo
EG	Egg
EL	Elver
EM	Embryo
EY	Eyed stage
FI	Fingerling
FY	Fry
GA	Gastrula
GE	Gestation
GL	Glochidia
GM	Gamete
IG	Imago
IM	Immature
IN	Instar
IT	Intermolt

JV	Juvenile; fledgling, hatchling, weanling
LC	Lactational
LP	Larva-pupa
LR	Prolarvae
LV	Larvae
LO	Lobes
MA	Mature
ME	Megalopa
ML	Morula
MO	Molt
MX	Multiple
MY	Mysis
NB	New born
ND	Naiad
NE	Neonate
NH	New, newly, or recent hatch
NL	Neurala
NR	Not reported, unknown
NU	Nauplii
NY	Nymph
OO	Oocyte, ova
PA	Parr
PC	Pre-hatch
PD	Pre-molt
PE	Post emergence
PG	Post spawning

PI	Post molt
PJ	Pre-, sub-, semi- or near adult
PK	Post smolt
PN	Post nauplius
PO	Post hatch
PQ	Pre-larvae
PS	Pre smolt
PT	Protolarvae
PU	Pupa
PV	Post larvae
PW	Pre-spawning
PY	Post embryo
PZ	Protozoa
SA	Subadult
SC	Yolk-sac larvae, sac larvae
SF	Sac fry, yolk sac fry
SI	Sexually immature
SM	Sexually mature
SMT	Smolt
SO	Sporeling
SP	Sperm
SR	Spore
ST	Spat
SU	Swim-up
TA	tadpole
UY	Underyearling

VI	Virgin
YA	Young adult
YE	Yearling
YO	Young
YY	Young of the year
ZO	Zoea
ZY	Zygote

II. Plant lifestage codes

Code	Definition
BS	Bud blast stage
EX	Exponential Growth Phase
FB	Mature, full-bloom stage (fruit trees)
FG	Female gametophyte
FO	Flower opening
GP	Lag growth phase
GS	Germinated seed
IB	Incipient bud
LG	Log growth phase
MD	Mature dormant
MG	Male gametophyte
MX	Multiple stages
MT	Mature, no specified stage
PB	Mature, post-bloom stage (fruit trees)
PH	Mature, pit-hardening stage (fruit trees)
RC	Rooted cuttings

Code	Definition
RP	Mature reproductive
RST	Rootstock
SB	Shoot
SE	Scape elongation
SD	Seed
SG	Mature, side-green stage (fruit trees)
SL	Seedling
SN	Sapling
SY	Stationary growth phase
TC	Tissue culture callus
TU	Tuber
VG	Mature vegetative

Appendix G. Soil Type Codes

Standard Artificial Soils:

OECD 1984	Organization for Economic Cooperation and Development 1984
OECD 1993	Organization for Economic Cooperation and Development 1993
EEC	Council of European Communities
ISO 1994	International Standard Organization 1994

Standard Artificial Soil Characteristics		
Soil Type	Organic Matter	pH
OECD 1984	10 % peat	6.0
OECD 1993	10 % peat	6.0
EEC	10 % peat	6.0
ISO 1994	10 % peat	6.0

Appendix H. Test Location Codes

Code	Definition
FieldA	Field, Artificial - a simulated or artificial field study is conducted in “an artificially bounded system that is a simplification of a specific ecosystem”, e.g. aviaries, pens, enclosures, outdoor pots
FieldN	Field, Natural - a natural field study is one “in which both the test system [...] and exposure to the stressor are “naturally” derived”; e.g. sprayed agricultural field or orchard plots, field surveys.
FieldU	Field, Unable to determine whether natural or artificial setting
Lab	Laboratory indoor setting, including environmental chamber, greenhouse, lath house, garden frame or indoor pots
NR	Not Reported ; unable to determine whether laboratory or field

Appendix I. Valid Duration Units

Code	Definition
s	second
mi	minute
h	hour
d	day
wk	week
mo	month
yr	year
lf	lifetime; no associated numeric value
NR	time information not reported
alv	alevin
abs	until ab scission
ac	age class
ant	until an thesis
b0.25	0.25 b loom stage
blm	b loom stage
brd	Brood or litter
bs	bud blast stage
bt	to b oot stage
cfs	to c ommercial f lower s tage
clv	c leavage
crs	crab stage
cs	cell stage
dpe	d ays p ost- e mergence
dd	degree days

Code	Definition
dph	days post hatch
dphv	days post harvest
dpf	days post fertilization
dpn	days post-natal
dpo	days post oviposition
dpr	days post-release
dps	days post spawn
dpt	days pre-fertilization
dpu	days post-swim up
dpw	days post swimming
dbh	days pre-hatch
ea	to e aring or heading
eb	e arly b loom stage
eslk	to e arly s ilk stage
el	nth e gg l aid
em	to e mergence
eso	e nd of s hooting stage
ey	e yed stage (time to eyed stage of fish eggs)
f5	50% f lowering
fb	f ull b loom stage
fd	frond
frt	to fertilization
fi	f lower initiation
fl	f lower stage
fr	to f ruit stage

Code	Definition
frt	to fertilization
fry	fry
fs	f lowering s tage
ge	g eneration
gm	to g ermination
go	gosner stage
gs	g rowing s ea s on
hbf	hours pre-fertilization
hpe	hours post emergence
hpf	h ours p ost f ertilization
hph	h ours p ost h atch
hpr	hours post-release
hv	h arvest
ht	until h atch
i2	intermolt to 2nd molt
inst	instar
it	intermolt to molt
kh	k nee- h igh stage
log	to log phase
ls	leaf stage
ls4	4 - 6 leaf s tage
ls6	6 leaf s tage
ls9	9 - 10 leaf s tage
LSI	Larval Stage Index
ma	to m aturity

Code	Definition
mpf	minutes post fertilization
mph	months post hatch
myp	M ysis to p ost-larvae
pan	p anicling stage
pd	1 st p od set
pgm	post germination
pm	p ost m olt
pr	p riming (The harvesting of ripened tobacco leaves)
pro	p ropagation stage
rc	ready for c onsumption
slk	to s ilk stage
so	s hooting stage
spf	seconds post fertilization
sst	substage
stg	stage
su	summer
swm	s wim-up
tr	1 st t rifoliate leaf
ts	time to t assle
vg	v egative stage
wbh	weeks pre-hatch
wpe	weeks post emergence
wph	weeks post hatch
wps	weeks post swim-up
yc	year class

Code	Definition
yph	years post-hatch
zm	z oeae- m egalop
zmy	z oeae to m ysis
-n	negative values represent pretreatment times
-x	pretreatment time unknown
/	NOT TO BE USED AFTER 10/15/99, USE QUALITATIVE CODES (ABOVE) INSTEAD: used when the duration is qualitative rather than quantitative; information is recorded as text in the Remarks (eg., 12 th egg after hatch but not end of study)

Appendix J. Exposure Type Codes

Code	Definition
D see Appendix J.1	Diet - exposure through consumption; includes diet and/or water intake; this code will be automatically assigned if one of the diet categories from Appendix J.1 is used
I see Appendix J.2	Injection -insertion of the toxicant into the skin, vessels, muscle, subcutaneous tissue, or any body cavity; this code will be automatically assigned if one of the injection categories from Appendix J.2 is used
M see Appendix J.3	Multiple-exposure to the toxicant through two or more different routes.
N see Appendix J.4	Inhalation - exposure to the toxicant through breathing; this code will be automatically assigned if one of the injection categories from Appendix J.3 is used
NR	Exposure type is Not Reported
T see Appendix J.5	Topical - exposure includes dermal, eggshell, immersion or soaking; this code will be automatically assigned if one of the topical categories from Appendix J.4 is used
V see Appendix J.6	Environmental - exposure includes field in situ and specific application types as well as incidental exposures; this code will be automatically assigned if one of the environmental categories from Appendix J.5 is us

Appendix J.1 Diet (D) Exposure Codes

Code	Definition
DT	diet, unspecified
FD	chemical incorporated into the food
DR	chemical incorporated into the water
CH	choice of treated or untreated food or water
GV	gavage
GE	Gestational (Exposed during gestation)
LC	Lactation (Exposed via mother's milk)
OR	oral via capsule

Appendix J.2 Injection (I) Codes

Code	Definition
IJ	injection, unspecified
IA	Intra-arterial (injected via the artery)
IG	intragastrical (digestive system)
IH	intrahemocoel
IM	intramuscular
IP	intraperitoneal
IL	intra placental
IR	intraprostomial
IS	intra segmentally (insects)
IE	intratesticular
IT	intratracheal
IV	intravenous

Code	Definition
SC	subcutaneous
SD	subdermal
YK	yolk

Appendix J.3 Multiple (M) Application Codes

Code	Definition
MU	multiple routes between application groups (e.g. dermal and inhalation)

Appendix J.4 Inhalation (N) Application Codes

Code	Definition
IH	inhalation

Appendix J.5 Topical (T) Application Codes

Code	Definition
DM	dermal
MM	immersion
OC	ocular
PC	percutaneous
SA	surface area dose
SH	eggshell
TP	topical, general

Appendix J.6 Environmental (V) Exposure Codes [Also AQUIRE Field Test AP Type]

Code	Definition
AE	aerial (unknown type)

Code	Definition
AG	aerial-granular
AS	aerial spray application
CM	culture medium application
DA	direct application
DU	dusted
DW	dropwise application
EN	environmental, unspecified
FS	foliar spray
FU	fumigation
GG	ground granular
GM	growth medium application
GS	ground spray
HP	hydroponic solution application
HS	hand spray
IN	in situ
MI	misted
MT	multiple routes within environmental exposures, eg. Aerial spray and soil slurry to the same plots.
PR	present in soil
PT	painted
PU	pump
SO	dipped or soaked
SP	spray
SS	soil slurry
WA	watered

Appendix J.7 AQUIRE ONLY Exposure Type Codes**AQUIRE Lab Exposure Types (EXP TYP)**

Code	Definition
[C]	Topical Exposure (Use specific code from App. J.5)
[D]	Diet or Oral exposure (includes simultaneous diet and water exposure) (Use specific code from App. J.1)
F	Flow-through
[I]	Injection (Use specific code from App. J.2)
L	Leaching (used for leachate and sediment exposures, if water conc reported)
P	Pulse (intermittent or fluctuating dosing)
R	Renewal
S	Static (recirculating exposures are noted in <u>Exp Design</u>); algae tests where the time is <= 24 hr, static may be assumed, and coded as such by the reviewer

AQUIRE Field Exposure Types (EXP TYP)

Code	Definition
B	Tidal
[D]	Diet (Use specific code from App. J.1)
E	Lentic (static water system without measureable flow rate, e.g. ponds, lakes, troughs, irrigation ditches)
I	Injection
O	Lotic (flowing water system, e.g. streams)

[] = Old code. The codes will require maintenance to update records with new codes.

Appendix K. Application Frequency Codes

Code	Definition
ADL	Ad libitum ; without limit or restraint
CON	Continual ; non-pulsed
D/WK, 10-13WK	X times per week for 10 to 13 weeks
DLY	Daily ; dosing regime not specified
DLY for X D	Daily for X days
DLY for 5 D	Daily for 5 days
EOD	Every other day
E X D	Every X days
E X H	Every X hours
E x H for 20 D	Every X hours for 20 days
E x MI	Every x minutes
E X WK	Every X weeks
G per D	Grams per day
H	Hour
H/D for 8 D	X hours per day for 8 days
HED	X hours every day
IN	in situ
RES	Restricted
STG	Stage
WKY	Weekly
X	Dosed x time(s) per study period; e.g. 1 time = 1X

X E 7-15 D	X times every 7 to 15 days
X for 1 H	X times for 1 hour
X for 1 MI	X times for 1 minute
X for 10 MI	X times for 10 minutes
X for 12 H	X times for 12 hours
X for 15 MI	X times for 15 minutes
X for 2 D	X times for 2 days
X for 2 H	X times for 2 hours
X for 24 H	X times for 24 hours
X for 3 H	X times for 3 hours
X for 3.5 H	X times for 3.5 hours
X for 30 MI	X times for 30 minutes
X for 5 H	X times for 5 hours
X for 5 MI	X times for 5 minutes
X for 6 H	X times for 6 hours
X for 60 MI	X times for 60 minutes
X H E12H	X hours every 12 hours
X H E3D	X hours every 3 days
X H EOD	X hours every other day
X H per D	X hours per day
X H WKY	X hours weekly
X in 12 H	X times in 12 hours
in 14 D	X times in 14 days
X in 24-72 H	X times in 24 to 72 hours

X in 48 H	X times in 48 hours
X MI per D	X minutes per day
X per FI	X times per flower initiation
X per h	X times per hour
X per 24 H	X times per 24 hours
X per 2d	X times per 2 days
X per 3d	X times per 3 days
X per 4d	X times per 4 days
X per 5 D	X times per 5 days
X per 12d	X times per 12 days
X per 14d	X times per 14 days
X per D, 10 X	X times per day, 10 times
X per D, 6 D/WK	X times per day, 6 days per week
X per d	X times per day
X per wk	X times per week
X per 2 wk	X times per 2 weeks
X per 6 WK	X times per 6 weeks
X per mo	X times per month
X per yr	X times per year
X, 1X/D	X times, 1 time per day
X, 1X/Y	X times, 1 time per year
X, 1X/20 D	X times, 1 time per 20 days
X, 1X/2WK	X times, 1 time per 2 weeks

X, 1X/4WK	X times, 1 time per 4 weeks
, 2X in 14 H	X times, 2 times in 14 hours
X, 2X per WK	X times, 2 times per week
X, 96 H apart	X times, 96 hours apart
X,1 X E 15 D	X times, 1 time every 15 days
X,1 X per 15 D	X times, 1 time per 15 days
X,1Xper9-13D	X times, 1 time per 9-13 days
X,24 H per 14 D	X times, 24 hours per 14 days
X,48H apt E14D	X times, 48 hours apart every 14 days
X/WK for 3 WK	X times per week for 3 weeks
NR	Not Reported

Appendix L. Exposure Media Codes

Code	Definition
AGR	Agar
AQU	Aqueous
ART	Artificial soil (This includes soils that are created from individual soil components. For example, if clay, sand and organic matter are combined, as in OECD soils, these soils are coded as artificial.)
CUL	Culture Medium
FLT	Filter paper
HUM	Humus
HYP	Hydroponic
LIT	Litter
MAN	Manure
MIN	Mineral soil
MIX	Media Mixture (with comment)
NAT	Natural soil (This includes natural soils that are amended with nutrients.)
NONE	No substrate
NR	Not reported
OTH/	Other (with comment) Use this code when odd combinations of media are used and remark in Soil Information comments, i.e. 50/50 mixture of farina and peat
POP	Plaster of Paris
SLG	Sludge
UKS	Unspecified soil type

Appendix M. Control Type and Dose ID Codes

Code	Definition
B	B aseline or background control: parameters of actual or representative test species measured before and after administration of test chemical, though not as part of the same test scenario. Note: pretreatment values, collected during the same test scenario as the observed responses, are recorded as exposure concentrations with a negative exposure duration; <u>not</u> as baseline control parameters.
C	C oncurrent control: controls are run simultaneously with the exposure, e.g. in the laboratory where a chemical free test chamber is used or in field studies where the control data are obtained upstream from the exposure data; also includes field tests where the controls are run in a separate system, ie. pond A and pond B or field A and field B
D	Exposure D ose level identifier
E	E ndpoint link identifier
H	H istorical control: applicable to natural field system testing, data collected prior to exposure often during an independent long-term survey of the area; see also B - B aseline
K	Data for control is presented but without accompanying methodology to identify procedures used
M	M ultiple controls were reported, e.g. historic and concurrent
NR	N ot reported; there is no information about presence or absence of controls in the publication
O	The ' O ' code should be used when a control is run in a different system (e.g. defined by different dilution water or soil properties) than the exposure treatments; e.g., control from pond A and effect information from pond B. See also C for concurrent controls. This also includes laboratory studies where different solvents are used for control versus treatment (e.g. Water was used as a solvent for test compound, controls were injected with saline, or a blood sample from an unexposed female used for a control for an exposed male).

P	Positive controls were used
R	Range of doses
V	Carrier or solvent; organisms exposed to carrier or solvent as the only control
Z	Author states that no controls were used in the study

Appendix N. Exposure Dose and Observation/Response Value Units

a-amino N/24h	alpha aminonitrogen per 24 hours	bees/d	bees per day
absrb	absorbance	BO:LI	bone to liver ratio
act	activity	Bq	becquerels
act/g pro	activity per gram protein	Bq/g	becquerels per gram
act/g TI	activity per gram tissue	Bq/L	becquerels per liter
activ/noactiv	activated to non-activated ratio	Bq/kg	becquerels per kilogram
acts/3 mi	acts per 3 minutes	Bq/mg	becquerels per milligram
ad	adults	Bq/ml	becquerels per milliliter
ad/jv	adults per juvenile	Bq/org	becquerels per organism
ae lb/100 gal	acid equivalent pounds per 100 gallons	bits	bits
AI	active ingredient; followed by the unit, eg AI kg/ha	BR:BL	ratio of brain to blood
ai g/m2	grams active ingredients per square meter	branches/org	number of branches per organism
ai g/100m2	grams active ingredient per 100 square meters	bt/mi	beats per minute
ai l/ha	active ingredient liters per hectare	BU	Bessey Units
AI mg/d	milligrams active ingredient per day	bushels	bushels
ai mg/kg	milligrams active ingredient per kilogram	burrows	burrows
ai mg/kg org	milligrams active ingredient per kilogram organism	C	Centigrade, degrees
ai mg/L	milligrams active ingredient per liter	cal	calories
ai mg/ml	milligrams active ingredient per milliliter	cal/d	calories per day
ai ppm	parts per million active ingredient	castings	earthworm castings
ai ml/100m2	milliliters active ingredient per 100 square meters	casts/eu	casts per experimental unit
ai ug/cm2	micrograms active ingredient per square centimeter	casts/m2/d	casts per square meter per day
ai ug/g soil	micrograms active ingredient per gram soil	casts/pl	casts per plot
amend:unamend	ratio of amended to unamended treatments	cc	cocoons
AU	arbitrary units	cc/ad	cocoons per adult
B'	Chromatid break	cc/10 ad	cocoons per 10 adults
B''	Isochromatid break	cc/eu	cocoons per experimental unit
BB unit	BB unit	cc/cntr	cocoons per container
b/ml	billions per milliliter	cc/org	cocoons per organism
beats/mi	beats per minute	cc/org/8wk	cocoons per organism per 8 weeks
beats*ml/mi2	beats * milliliter per square minutes	cc/org/wk	cocoons per organism per week
		cc/sad	cocoons per surviving adult
		cc/unit	cocoons per unit
		cells	cells
		cells/1e+6 cells	cells per 1 X 10 +6 cells
		cells/50 mg	cells per 50 milligrams
		cells/100 clm	cells per 100 coelomocytes
		cells/area	cells per area
		cells/mg TI	cells per milligram tissue
		cell/mi x10x3	cells per minute x10x3
		cells/ml	cells per milliliter
		cells/mm2	cells per square millimeter
		cell/mm3	cells per cubic millimeter
		cells/mm cortex	cells per millimeter cortex
		cells/mm folium	cells per millimeter folium
		cell:nuclei	ratio of cells to nuclei
		cells/TI	cells per tissue

cell/u.a	cells per unit area	cpm/org	counts per minute per organism
cellx10x2/uI	cells x10x2 per microliter	CRB:BR	ratio of cerebellum to brain
cell/8 srtI cel	cells per 8 Sertoli cells	CRM:BR	ration of cerebrum to brain
cfu/mg	colony forming units per milligram	cRNA/mgRNA/DNA	(counts per minute RNA per milligram RNA) per milligram DNA
chem/d	chemical per day	cwt/acre	hundredweights per acre
CHLA:CHLB	ratio of chlorophyll a to chlorophyll b	cyc/deg	cycles per degree
CI	color index	d	day
Ci/L	curies per liter	DB/mg pro	lipid aliphatic double bounds per milligram protein
Ci/mol	curies per mole	dead:live	ratio of dead to live organisms
Ci/mmol	curies per millimole	degree	degree
clusters	clusters	divisions/cell	divisions per cell
clutches	clutches	dm2	decimeters squared
cm	centimeter	DNA:protein	DNA to protein ratio
cm/d	centimeters per day	DNA:RNA	DNA to RNA ratio
cm/g soil	centimeters per gram soil	dpm	disintegrations per minute
cm/g bdwt/h	centimeters per gram bodyweight per hour	dpm/167 mg TI	disintegrations per minute per 167 milligrams tissue
cm H2O	centimeters of water	dpm/EU	disintegrations per minute per experimental unit
cm/cm3	centimeters per cubic centimeter	dpm/g	disintegrations per minute per gram of tissue
cm2	centimeters squared	dpm/g*100	disintegrations per minute per gram*100
cm2/kg	centimeters squared per kilogram	dpm/800g soil	disintegrations per minute per 800 grams of soil
cm2/org	centimeters squared per organism	dpm/mg	disintegrations per minute per milligram
cm2/100bees	centimeters squared per 100 bees	dpm/mg FA	disintegrations per minute per milligram fatty acid
cm3	cubic centimeters	dpm/mg GH	disintegrations per minute per milligram growth hormone
cm3/eu	cubic centimeters per experimental unit	dpm/mg GH*100	disintegrations per minute per milligram growth hormone*100
cm/wk	centimeters per week	dpm/mg pro	disintegrations per minute per milligram protein
cmol/kg	centimoles of charges per kilogram	dpm/ml	disintegrations per minute per milliliter
cpm	counts per minute	dpm/n	disintegrations per minute per N
cpm X 1000	counts per minute X 1000	dpm treat:cntl	ration of disintegrations per minute treated to control
cpm/1e+5 cells	counts per minute per 1X10+5 cells	dS/m	deciSiemens per meter
cpm/cc	counts per minute per cocoon	e/100hd	eggs per 100 hen days
cpm/g TI	counts per minute per gram tissue	e/hd	eggs per hen day
cpm/L	counts per minute per liter		
cpm/mg	counts per minute per milligram		
cpm/mg pro	counts per minute per milligram protein		
cpm/mg RNA	counts per minute per milligram RNA		
cpm/mg UA	counts per minute per milligram uronic acid		
cpm/ml	counts per minute per millimeter		

e/org	eggs per organism	fmol/mg pro	femtomol per milligram
e/org/d	eggs per organism per day	fr	protein
e/org/wk	eggs per organism per week	FU/g	frames (bees)
ea/eu	ears per experimental unit	G'	fluorescence units per gram
eggs	egg(s)	G''	Chromatid gap
eggs/BDAY	eggs per bird-day	g	Isochromatid gap
eggs/d	eggs per day	g%	grams
eggs/fm	eggs per female	g% w/v	gram percent
eggs/fm/d	eggs per female per week	g/0.25 acre	gram percent on a weight per volume basis
eggs/fm/wk	eggs per female per week	g/0.5 m2	grams per 0.25 acres
eggs/100 ad	eggs per 100 adults	g/100l	grams per 0.5 meters squared
eggs/org	eggs per organism	g/100g	grams per 100 liters
eggs/org/d	eggs per organism per day	g/100g BW	grams per 100 grams
egg/org/wk	eggs per organism per week	g/100g BW/d	grams per 100 grams body weight
eggs/pair	eggs per pair	g/100g bdwt/h	grams per 100 grams body weight per day
eggs/raft	eggs per raft	g/100g org	grams per 100 grams per bodyweight/hour
em/FM	embryos per female	g/100kg org	grams per 100 grams organism
enz act	enzyme activity or enzyme activity unit	g/d/100kg org	grams per 100 kilograms organism
enz act/mg	enzyme activity per milligram	g/100 le	grams per day per 100 kilograms organism
eq/l	equivalents per liter	g/100 L	grams per 100 leaves
eu	enzyme unit	g/100ml	grams per 100 liters
EU/g	enzyme unit (amount of enzyme needed to catalyze)/g	g/100sd	grams per 100 milliliters
		g/100 stl	grams per 100 seeds
		g/1000g	grams per 100 stolons
		g/1000gr	grams per 1000 grams
FD:Gain	ratio of weight of food consumed to weight gained	g/13.125 ft2	grams per 1000 grains
		g/200 m2	grams per 13.125 square feet
		g/2500cm2	grams per 200 square meters
FD:WTR	food to water ratio	g/4 d	grams per 2500 centimeters squared
FER	feed efficiency ratio	g/400m	grams per 4 days
fl	femtoliters	g/5 kg soil	grams per 400 meters
FT:PLC	fetus to placenta ratio	g/5 m2	grams per 5 kilograms soil
fet	fetuses	g/70d	grams per 5 meters squared
fetuses/litter	fetuses per litter	g/acre	grams per 70 days
final:initial	ratio of initial parameter to final parameter	g/BDAY	grams per acre
fledge/pair	fledglings per pair or young fledged per pair	g/bdwt e0.75	grams per bird-day
fm	females	g/bee	grams per body weight * 1e0.75
fm/lit	females per litter	g/cc	grams per bee
fmol	femtomol	g/cm	grams per cocoon
			grams per centimeter

g/cm2	grams per square centimeter	g/1.8 kg soil	grams per 1.8 kilogram soil
g/ctnr	grams per experimental container	g/L	grams per liter
g/d	grams per day	g/LE	grams per leaf
g/d/org	grams per day per organism	g/m2	grams per square meter
g/d/wght	grams per day per weight	g/m3	grams per cubic meter
g/dl	grams per deciliter	g/org	grams per organism
g/eu	grams per experimental unit	g/org/d	grams per organism per day
g/fed	grams per feddan (1 feddan = 1.038 acres)	g/org/42 d	grams per organism per 42 days
g/fish	grams per fish	g/org/eu	grams per organism per experimental unit
g/fruit	grams per fruit	g/org/wk	grams per organism per week
g/ft2	grams per square foot	g/quadrant	grams per quadrant
g/g bdwt	grams per gram body weight	g/sample	grams per sample
g/g bdwt/d	grams per gram body weight per day	g/shell	grams per shell
g/g dry humus	grams per gram dry humus	g/ug	grams per microgram
g/g fd	grams per gram food	g/wk	grams per week
g/g org	grams per gram organism	Gain:FD	ratio of weight gained to weight of food consumed
g GAIN/kg fd	grams weight gained per kilogram food	gal/acre	gallons per acre
g/h	grams per hour	gamma/day	gamma/day (Von Bertalanffy growth)
g H2O/dm2/h	grams H2O per squared decameter per hour	gamma/g TI	gamma counts per gram tissue
g/ha	grams per hectare	gg	gamma gamma
g/jv	grams per juvenile	gila:neuron	gila to neuron ratio
g/kg	grams per kilogram	grade	grade
g/kg/d	grams per kilogram per day	grain/panicle	grains per panicle
g/kg bdwt	grams per kilogram body weight	h	hour
g/kg bdwt/d	grams per kilogram body weight per dry soil	H'	Shannon-Weiner Diversity index
g/kg feed	grams per kilogram of feed	HA units	Hemagglutinating units
g/kg fd	grams per kilogram food	hatchability	hatchability
g/kg soil	grams per kilogram soil	hsk:gr	ratio plant husk to grain
g/1.2 kg soil	grams per 1.2 kilogram soil	Hz	Hertz
g/1.4 kg soil	grams per 1.4 kilogram soil	Hz/s	Hertz per second
g/1.6 kg soil	grams per 1.6 kilogram soil	in	inches
		in2	inches squared
		inclusion	internuclear inclusion body
		index	index
		IU	International Units (One IU is the amount of enzyme consuming or forming 1 umol substrate or 1 umol product per minute under standard conditions.) May also be noted as "SI units" (Système International d'unités)
		IU/g	International Units per gram

IU/l	International Units per liter	kcal/d	kilocalories per day
IU/kg	International Units per kilogram	kg	kilograms
IU/kg bdwt	International units per kilogram body weight	kg/0.5 m2	kilograms per 0.5 square meters
IU/mg	International Units per milligram	kg/11 m	kilograms per 11 meters
IU/mg Hb	International units per milligram hemoglobin	kg/d	kilograms per day
IU/mg TI	International units per milligram tissue	kg/eu	kilograms per experimental unit
IU/orgwt	International Units per organ weight	kg/fed	kilograms per feddan (1 feddan = 1.038 acres)
J/beat	Joules per beat	kg/ha	kilograms per hectare
J/d	Joules per day	kg/L	kilograms per liter
jv	juveniles	kg/mi2/mo	kilograms per square mile per month
jv/ad	juveniles per adult	kg/mu	kilograms per mu
jv/cc	juveniles per cocoon	kg/org	kilograms per organism
jv/cntr	juveniles per container	kg/org/d	kilograms per organism per day
jv/eu	juveniles per experimental unit	kg/wk	kilograms per week
jv/fm	juveniles per female	kJ/d/org	kilojoules per day per organism
jv/ftcc	juveniles per fertile cocoon	kmol/m3	kilomoles per cubic meter
jv/lit	juveniles per litter	KA/100ml	king/armstrong units per 100 milliliters
jv/mated fm	juvenile per mated female	KI:BR	kidney to brain ratio
jv/org/wk	juveniles per organisms per week	Kunit/ml	k unit per milliliter
jv/org	juveniles per organism	L	liters
k2/d	elimination rate constant 2 per day	lamellae/axon	lamellae per axon
K units	Karmen units	layers	layers
KA units	King/Armstrong units	l/24 h	liters per 24 hours
ka/d	elimination rate constant a per day	L/ha	liters per hectare
kBq	kilobecquerels	l/l	liter per liter
kBq/L	kilobecquerels per liter	l/m2	liters per square meter
kBq/dm3	kilobecquerels per cubic decimeter	lb	pounds
kBq/eu	kilobecquerels per experimental unit	lb/11 gal/acre	pound per 11 gallons per acre
kBq/ml	kilobecquerels per milliliter	lb/acre	pounds per acre
K/ml	karmen units per milliliter	lb/ac ft	pounds per acre foot
kcal	kilocalories	lbs ae/ac	pounds acid equivalent per acre
		lb/cwt sd	pounds per hundred weight seed
		lb/d	pounds per day
		lb/eu	pounds per experimental unit
		lb/ft2	pounds per square foot
		lb/gal	pounds per gallon
		lb/org/d	pounds per organism per day
		lb/plot	pounds per plot
		LGTH/s	length per second
		LGTH:THIK	ratio of length to thickness

LI:BR	liver to brain ratio		gram of needles
lit	litters	mg NH3/ g org	milligrams ammonia per gram
lit/pr	litters per pair		of organism
ln(Wf/Wi)	natural log(mean survivor weight/mean initial weight)	mg NH3/g org/h	milligrams ammonia per gram of organism per hour
log rel	log relative activity/intensity	mg O2/g org	milligrams oxygen per gram of organism
log2	log squared	mg O2/g org/h	milligrams oxygen per gram of organism per hour
log2 titers	log2 titers	mg pro/g	milligrams protein per gram
log 10 ug/g org	log 10 micrograms per gram organism	mg urea /g org	milligrams urea per gram of organism
LU:BR	lung to brain ratio	mg urea/g org/h	milligrams urea per gram of organism per hour
maturity index	maturity index		milligrams per percent
m3	cubic meters	mg/%	milligrams per organism per day
mBq	millibecquerels	mg/0/d	milligrams per 10 grams body weight
mBq/ml	millibecquerels per milliliter	mg/10 g bdwt	milligrams per 100
mCi	milliCuries	mg/100g	grams
mCi mg	milliCuries milligram		milligrams per 100 grams
mCi/mg	milliCuries per milligram	mg/100g org	organism
mCi/ml	millicuries per milliliter		milligrams per 100 grams
mCi/mmol	milliCuries per millimoles	mg/100g bw	body weight
mg CO2/dm2/h	milligrams carbon dioxide per squared decameter per hour	mg/100g bw/d	milligrams per 100 grams
metric t/ha	metric tons per hectare	mg/100kg org	body weight per day
mM	milliMolar (millimoles per liter)	mg/100 lbs	milligrams per 100 kilograms of organism
		mg/100lb/d	milligrams per 100 pounds
m enz act/mg	millienzyme activity per milligram	mg/100 mg TI	per day
meq	milliequivalents		milligrams per 100 milligrams tissue
meq/g	milliequivalents per gram	mg/100ml	milligrams per 100
meq/kg	milliequivalents per kilogram	mg/10g	milliliters
meq/L	milliequivalents per liter	mg/10g org	milligrams per 10 grams
meq/100 g	milliequivalents per 100 grams	mg/12h	milligrams per 10 grams organism
mg	milligrams	mg/24h	milligrams per 12 hours
mg ^{1/3}	milligrams to 1/3 power	mg/24h/kg	milligrams per 24 hours
mg %	milligrams percent		milligrams per 24 hours per kilogram
mg C/g OM	milligrams carbon per gram organic matter	mg/3 kg	milligrams per 3 kilograms
mg CO2/h/g	milligrams carbon dioxide per hour per gram	mg/454g	milligrams per 454 grams
		mg/70g	milligrams per 70 grams
		mg/bee	milligrams per bee
		mg/cc	milligrams per cocoon
mg CO2/hr/g ndl	milligrams carbon dioxide per hour per	mg/cntr	milligrams per container
		mg/cm	milligrams per centimeter

mg/cm2	milligrams per square centimeter	mg/h	gram body weight milligrams per hour
mg/cm2*torr	milligrams per square centimeter X Torr	mg/ha	milligrams per hectare
mg/cm2/d	milligrams per square centimeter per day	mg H2O/d*cm2*T	milligrams water per day*square centimeters*Torr
mg/cm3	milligrams per cubic centimeter	mg H2O/d*cm2*torr	milligrams water per day X square centimeter X Torr
mg/d	milligrams per day	mg/in2/d	milligrams per square inch per day
mg/d/bdwt	milligrams per day per body weight	mg/jv	milligrams per juvenile
mg/d/wght	milligrams per day per weight	mg/kg	milligrams per kilogram
mg/d/100 mg org	milligrams per day per 100 grams organisms	mg/kg bdwt	milligrams per killogram body weight
mg/d/100 lbs	milligrams per day per 100 pounds	mg/kg bdwt/d	milligrams per killogram body weight per day
mg/dl	milligrams per deciliter	mg/kg bdwt/wk	milligrams per kilogram body weight per week
mg/dm3	milligrams per cubed decimeter	mg/kg dw org/d	milligrams per kilogram dry weight organism per day
mg/dose	milligrams per dose	mg/kg d soil	milligrams per kilograms dry soil
mg/eu	milligrams per experimental unit	mg/kg diet	milligrams per kilogram diet
mg/fish	milligrams per fish	mg/kg dry wt	milligrams per kilogram dry weight
mg/g	milligrams per gram	mg/kg fd	milligrams per killogram food
mg/g ash	milligrams per gram ash	mg/kg litter	milligrams per kilogram litter
mg/g bdwt	milligrams per gram body weight	mg/kg media	milligrams per kilogram media
mg/g/ clay	milligrams per gram clay	mg/kg org	milligrams per kilogram organism
mg/g fluid	milligrams per gram fluid	mg/kg soil	milligrams per kilogram soil
mg/g humus	milligrams per gram humus	mg/kg d soil	milligrams per kilogram dry soil
mg/g N	milligrams per gram nitrogen	mg/kg TI	micrograms per milligrams tissue
mg/g org	milligrams per gram of organism	mg/kg/d	milligrams per kilogram per day
mg/g pod	milligrams per gram of pod	mg/kg/fish	milligrams per kilogram per fish
mg/g soil	milligrams per gram of soil	mg/kg/L	milligrams per kilogram per liter
mg/g/d	milligrams per gram per day	mg/kg org/d	milligrams per kilogram organism per day
mg/g MIT	micrograms per gram mitochondria	mg/kg/wk	milligrams per kilogram per week
mg/g pro	milligrams per gram protein	mg/kg wt	milligrams per kilogram weight
mg/g TI	milligrams per gram tissue	mg/kg wt/d	milligrams per kilogram weight per day
mg/gland/g bdwt	milligrams per gland per	mg/l	milligrams per liter

mg/L/d	milligram per liter per day		body weight per day
mg/L media	milligrams per liter media	ml/16h	milliliters per 16 hours
mg/m3	milligrams per cubic meter	ml/24 h	milliliters per 24 hours
mg/mg	milligrams per milligram	ml/70d	milliliters per 70 days
mg/mg node	milligrams per milligram nodules	ml/body wt	milliliters per body weight
mg/mi	milligrams per minute	ml/cntr	milliliters per container
mg/ml	milligrams per milliliter	ml/d	milliliters per day
mg/org	milligrams per organism	ml/d/100g BW	milliliters per day per 100 grams bodyweight
mg/org/d	milligrams per organism per day	ml/d/org	milliliters per day per organism
mg/org/wk	milligrams per organism per week	ml/eu	milliliters per experimental unit
mg N/100 ml	milligrams nitrogen per 100 milliliter	ml/g food	milliliters per gram food
mg/orwt	milligrams per organ weight	ml/g/h	milliliters per gram per hour
mg P/h/g TI	milligrams phosphorus per hour per gram tissue	ml/h	milliliters per hour
mg/TI	milligrams per tissue	ml/ha	milliliters per hectare
mg TI/g bdwt	milligrams tissue per gram body weight	ml/injection	milliliters per injection
mg TI/kg bdwt	milligrams tissue per kilogram body weight	ml/kg	milliliters per kilogram
mg/wk	milligrams per week	ml/kg/d	milliliters per kilogram per day
mg CO2/m2/sec	milligrams carbon dioxide per squared meter per second	ml/kg org/d	milliliters per kilogram organism per day
mg p/g	milligrams protein per gram	ml/lit	males per litter
mg%	milligram %	ml/mi/kg	milliliters per minute per kilogram
mg/vol	milligrams per volume	ml/mi/100g	milliliters per minute per 100 grams
mi	minute	ml/org	milliliters per organism
mi/d	minutes per day	ml/org/d	milliliters per organism per day
mi/nmol Rh	minutes per nanomoles per nanomol rhodopsin	ml/plot	milliliters per plot
micronaires	micronaires	mlcl/actin mlcl	molecules per actin molecule
microns	microns	ML:FM	ratio of males to females
ml	milliliters	mm	millimeters
ML	males	mm x 100	millimeters x 100
ML/total	males per total population	mmg	micronmilligrams
ml/10 L	milliliter per 10 liters	mmHG	millimeters mercury
ml/100g	milliliters per 100 grams	mmHG/s	millimeters mercury per second
ml/100g BW	milliliters per 100 grams body weight	mm/d	millimeters per day
ml/100g bdwt/d	milliliters per 100 grams	mm/org	millimeters per organism
		mm/ug pro	millimeters per microgram protein
		mM/g	millimolar per gram
		mM/kg bdwt	millimoles per kilogram body weight
		mM/L	millimoles per liter
		mm2	square millimeters
		mm2/mm3 X 1e-9	square millimeters per cubic millimeter X 1 X 10 -9

mm2/org/d	square millimeters per organism per day	mol/g	moles per gram
mm3	cubic millimeters (abbreviated in	mol/g soil	moles per gram soil
some literature as cmm)		mol/m3	moles per cubic meter
mm3/100g d soil	cubic millimeters per 100 grams dry soil	mol/ml	moles per milliliter
mm3/L	cubic millimeters per liter	mol/org	moles per organism
mm3/mg/h	cubic millimeters per milligram per hour	mol NO2/h/g	moles NO2 per hour per gram
mm3/mm3	cubic millimeters per cubic millimeter	molal	molality
mmol	millimoles	mole%	mole percent
mmol/d	millimoles per day	M	molar
mmol/g	millimoles per gram	morph/org	ectomycorrhizal morphotypes per organism
mmol/g dry wt	millimoles per gram dry weight	mOsm	milliosmoles
mmol/100 g	millimoles per 100 grams	mosmols/l	mosmoles (conc osmotic particles in solution) per liter
mmol/g food	millimoles per gram food	mouse unit/ml	mouse units per milliliter
mmol/h/g TI	millimoles per hour per gram tissue	MPa	megaPascals
mmol/kg	millimoles per kilogram	mp/mg pro/15mi	microsomal proteins/milligram protein per 15 minutes
mmol/kg/d	millimoles per kilogram per day	ms	milliseconds
mmol/kg soil	millimoles per kilogram soil	mu	milliunits
mmol/L	millimoles per liter	mU/d	microunits per day
mmol/L soil	millimoles per liter soil	mU/g	milliUnits per gram organism
mmol/m2/s	millimoles per square meter per second	mU/ml	milliunit per milliliter
mmol/m3	millimoles per cubic meter	mU/24 h/kg	milliunit per 24 hours per kilogram
mmol/mi/mg	millimoles per minute per milligram	mu/mg	milliunit per milligram
mmol/mg/mi	millimoles per milligram per minute	mu/mi/ml	milliunit per minute per milliliter
mmol NO2/kg	millimoles nitrogen dioxide per kilogram	mu/ml	milliunit per milliliter
mmol H2O/m2/s	millimoles water per square meter per second	mu/24 h	milliunit per 24 hours
mo	month	mu/org	milliunit per organism
mol	moles	mW	milliwatts
mol/L	moles per liter	N	normal
		NA	not applicable
		nCi	nanoCuries
		nCi/g org	nanoCuries per gram organism
		nCi/L	nanoCuries per liter
		ng	nanograms
		ng/100g bdwt	nanograms per 100 grams per bodyweight
		ng/24h	nanograms per 24 hours
		ng ATP/g d soil	nanograms ATP per grams dry soil
		ng/cm	nanograms per centimeter
		ng/cm2	nanograms per square centimeter
		ng/d	nanograms per day
		ng/dl	nanograms per deciliter

ng/egg	nanograms per egg	nM/L	nanomolar per liter
ng/eu	nanograms per experimental unit	nM/g	nanomolar per gram
ng/fish	nanograms per fish	nM DSMN:uM LYSI	nanomoles desmosine to micromoles lysine ratio
ng/g	nanograms per gram	nmol	nanomoles
ng/g bdwt	nanograms per gram body weight	nmol/100mg pro/h	nanomoles per 100 milligrams protein per hour
ng/g/d	nanograms per gram per day	nmol ATP/g soil	nanomoles adenosine triphosphate per gram of soil
ng/g diet	nanograms per gram diet	nmol DOPA/g/h	nanomoles DOPA per gram per hour
ng/g dry wt	nanograms per gram dry weight	nmol enz/hr	nanomoles enzyme per hour
ng/g wet wt	nanograms per gram wet weight	nmol mdhyde/g	nanomoles malonaldehyde per gram
ng/g org	nanograms per gram organism	nmol PBG/h/ml	nanomoles porphobilinogen per hour per milliliter
ng/g TI/4 h	nanograms per gram tissue per 4 hours	nmol PBG/g TI/h	nanomoles porphobilinogen per gram tissue per hour
ng/gland	nanograms per gland	nmol/g	nanomoles per gram
ng/kg	nanograms per kilogram	nmol/g pro	nanomoles per gram protein
ng/kg fd	nanograms per kilogram food	nmol/g pro/mi	nanomoles per gram per protein per minute
ng/L	nanograms per liter	nmol/g ro/4 h	nanomoles per gram root per 4 hours
ng/mg	nanograms per milligram	nmol/g/30mi	nanomoles per gram per 30 minutes
ng/mg/mi	nanograms per milligram per minute	nmol/g/4 mi	nanomoles per gram
ng/mg fd	nanograms per milligram food	nmol/g/mi	nanomoles per gram per minute
ng/mg pro	nanograms per milligram protein	nmol/g/h	nanomoles per gram per hour
ng/min	nanograms per minute	nmol/g humus	nanomoles per gram per humus
ng/mi/org	nanograms per minute per organism	nmol/g soil	nanomoles per gram soil
ng/ml	nanograms per milliliter	nmol/g TI	nanomoles per gram tissue
ng/ml/mi	nanograms per milliliter per minute	nmol/g TI/h	nanomoles per g tissue per hour
ng/ml blood/d	nanograms per milliliter blood per day	nmol/h/mg pro	nanomoles per hour per milligram protein
ng/mm/day	nanograms per millimeter per day	nmol/h/ml RBC	nanomoles per hour per milliliter red blood cells
ng/org	nanograms per organism	nmol/kg	nanomoles per kilogram
ng/orwt	nanograms per organ weight	nmol/kg/m	nanomoles per kilogram per minute
ng/TI	nanograms per tissue	nmol/l	nanomoles per liter
ng/ul	nanograms per microliter	nmol/l RBC/h	nanomoles per milliliter red blood cells per hour
nkat/mg pro	nanokatal per milligrams protein	nmol MDA/mg pro	nanomoles malonaldehyde per milligram protein
nM	nanomolar (nanomoles per liter)		

nmol/mg	nanomoles per milligram	no/5000 cells	number per 5000 cells
nmol/ml	nanomoles per milliliter	no/area	number per area
nmol/mg pro	nanomoles per milligram protein	no/cell	number per cell
nmol/mg pro/mi	nanomoles per milligram protein per minute	no/cm	number per centimeter
nmol/mg/20mi	nanomoles per milligram per 20 minutes	no/d	number per day
nmol/mg/mi	nanomoles per milligram per minute	no/eu	number per experimental unit
nmol/mgpro/30mi	nanomoles per milligram protein per 30 minutes	no/fm	number per female
nmol/mg TI	nanomoles per milligram tissue	no follicles	number of follicles
nmol/mi/g	nanomoles per minute per gram	no/g	number per gram
nmol/mi/mg pro	nanomoles per minute per milligram protein	no/g soil	number per gram soil
nmol/mi/ml	nanomoles per minute per milliliter	no/h	number per hour
nmol/mi/ml RBC	nanomoles per minute per milliliter red blood cells	no/ha	number per hectare
nmol/mlpro/30mi	nanomoles per milliliter protein per 30 minutes	no/litter	number of organisms per litter
nmol/nm p450/mi	nanomoles per nanomole cytochrome P450 per minute	no/m2	number per square meter
nmol/org/h	nanomoles per organism per hour	no/mm3	number per cubic millimeter (also known as no/cmm)
nmol/org/0.5 h	nanomoles per organism per 0.5 hours	no/mi	number per minute
nmol/org/h	nanomoles per organism per hour	no/mm2	number per square millimeter
nmol/TI	nanomoles per tissue	no/mm2 * 1e-4	number per square millimeter X 1 X 10 ⁻⁴
no	number	no/mm3 * 1e-4	number per cubic millimeter X 1 X 10 ⁻⁴
no >15cm	number that are greater than 15 centimeters	no/mm3 * 1e-8	number per cubic millimeter X 1 X 10 ⁻⁸
no/1 mi	number per 1 minute	no/neuron * 1e-3	number per neuron X 1 X 10 ⁻³
no/5 mi	number per 5 minutes	no/nuclei	number per nuclei
no/10 mi	number per 10 minutes	no/org	number per organism
no/30 mi	number per 30 minutes	no/panicle	number per panicle
no/100 blsm clt	number per 100 blossom cluster	no/plot	number per plot
no/100u2	number per 100 square microns	no/preg FM	number per pregnant female
no/200 cells	number per 200 cells	no/sec	number per second
no/1000 um2	number per 1000 square micrometers	no/section	number per section
no/1500x field	number per 1500x field	no/sertoli cells	number per sertoli cells
		no/so	number per shoot
		no/trap	number per trap
		no/100 WBC	number per 100 white blood cells
		no/100um2	number per 100 square micrometers
		no/1000	number per 1000
		no/1000 RBCE	number per 1000 red blood cells
		no/33 lbs	number per 33 pounds
		no errors	no errors
		no sites	number of sites
		NR	not reported
		nuclei:nucleoi	ratio of nuclei to nucleoi
		OD	optical density

OD/100% RBC	optical density of 100% red blood cells	org/kg soil	organisms per kilogram soil
OD/g pro	units of optical density change per gram protein	org/km2	organisms per square kilometer
OD/mg pro	optical density per milligram protein	org/lit	organisms per litter
OD/WGHT	optical density per unit weight	org/m2	organisms per square meter
ODx10x3	optical density x10x3	org/mi	organisms per minute
open bol/org	open bolls per organism	org/plot	organisms per plot
org	organisms	org/sample	organisms per soil sample
org/10 m	organisms per 10 meters	org/sector	number of organisms per sector
org/100g soil	organisms per 100g soil	org/site	organisms per site
org/0.25ft2	organisms per 0.25 square feet	org/trap	organisms per trap
org/0.25m2	organisms per 0.25 square meters	org/trap/d	organisms per trap per day
org/0.3m	organisms per 0.3 meters	org/tree	organisms per tree
org/50cm2	organisms per 50 square centimeters	org/wk	organisms per week
org/60 leaves	organisms per 60 leaves	OT	optical transmission
org/200 m2	organisms per 200 square meters	OT/1 cm WDTH	optical transmission per 1 centimeter bone width
org/200cm3	number of organisms per 200 cubic centimeters of soil	OT/1 mm CCT	optical transmission per 1 millimeter combined cortical thickness
org/cm ro	organisms per centimeter root	OT/10 cm BO	optical transmission per 10 centimeters bone
org/cntr	organisms per container	OT/10 kg WGHT	optical transmission per 10 kilograms weight
org conc/soil c	organism concentration per soil concentration	OV:BR	ovary to brain ratio
org/d/cntr	organisms per day per container	oz/acre	ounces per acre
org/eu	organisms per experimental unit	%	percent
org/ft2	organisms per square foot	%act	percent activity
org/fm	organisms per female	%arb	percent arbuscularity
org/g	organisms per gram	%ash	percent ash
org/g dry soil	organisms per gram dry soil	% of bdwt	percent of body weight
org/g humus	organisms per gram humus	% cell volume	percent cell volume
org/g root	organisms per gram root	% CEC	% of soil cation exchange capacity
org/g soil	organisms per gram soil	% change	percent change
org/ha	organisms per hectare	% clitellate	percent clitellate
		% corn	percent corn pollen
		% cortex	percent of cortex
		% dev CNTL	percent deviation from control
		% d wght	percent dry weight
		% dose ret	percent dose retained
		% dose/h	percent dose per hour
		% DT	percent of digestive tract
		% earliness	percent earliness (percent of total cotton yield obtained during the first picking)
		% FATL	percent of total fatty acids
		%FM	percent female

%lit	percent of litter	pc	permeability constant
% mg	percent milligrams	PCI	plastochron index
% mg/g bdwt	percent milligrams per gram body weight	pCi/g	picoCuries per gram
		pCi/L	picoCuries per liter
% ML	percent male	pCi/ml	picoCuries per milliliter
% NaCl	percent sodium chloride	pecks/s	pecks per second
% of CNTL	percent of control	pellet/d	pellets per day
% of diet	percent of diet	pellet/org/d	pellets per organism per day
% of initial	percent of initial quantity	pellets	pellets
% of max yld	percent of maximum yield	pg	picograms
		pg/cell	picograms per cell
% org	percent of organisms	pg/dm3	picograms per cubic decimeter
% PRTL	percent of total protein		picograms per gram
% RBC	percent red blood cells	pg/g	picograms per liter
% sat	percent saturation	pg/L	picograms per milligram
% sperm	percent sperm	pg/mg org	organism
% tolerance	percent tolerance		picograms per milliliter
% total oil	percent of total oil content	pg/ml	picograms per organism
		pg/org	picograms per tissue
% g	percent grams	pg/TI	pH
%/g	percent per gram	pH	PI grams per liter
%*g	percent multiplied by weight in grams	PIg/L	
		PLC:BL	placenta to blood ratio
		PL:BL	plasma to blood ratio
% / min	percent per minute	pmol/hr/mg	picomoles per hour per milligram
%/ml	percent per milliliter		picomoles per gram
%/org/d	percent per organism per day	pmol/g	picomoles per gram per minute
% of total	percent of total	pmol/g/mi	picomoles per liter
% PLIPD	percent of total phospholipid		picomoles per millimeter
% total dose	percent total dose	pmol/L	picomoles per milligram
% vol	percent volume	pmol/ml	picomoles per milligram per day
% wet wght	percent wet weight	pmol/mg	picomoles per milligram
%/d	percent per day	pmol/mg/d	picomoles per milligram per minute
%/g TI	percent per gram tissue		picomoles per milligram per hour
%/wk	percent per week	pmol/mg pro/mi	protein per minute
[% inhib]	[percent inhibition]	pmol/mg pro/h	picomoles per milligram
% S/ppm Zn	percent sulfur per parts per million zinc		protein per hour
		pmol/mg/mi	picomoles per milligram per minute
%succ br/rm	percent successful broods per female	pmol/mg/ 10 mi	picomoles per milligram per 10 minutes
% wght	percent of weight		picomoles per milligram per hour
% wght/org	percent weight per organism	pmol/mg/h	picomoles per milligram per nanomol rhodopsin
% w/w	percent weight per weight		picomoles per minute per gram tissue
% w/v	percent weight per volume	pmol/mg/nmol R	picomoles per minute per milligram protein
% v/v	percent volume per volume	pmol/mi/g TI	
		pmol/mi/mg pro	

pmol/nm p450/mi	picomoles per nanomole cytochrome P450 per minute		total ventricle
ppb	parts per billion	s	seconds
ppb/2H/org	per two hours per organism	SA	Specific activity
ppm	parts per million	s/12 rpm	seconds per 12 revolutions per minute
ppm dw fd	parts per million dry weight food	s/16 rpm	seconds per 16 revolutions per minute
ppm food	parts per million food	s/8 rpm	seconds per 8 revolutions per minute
ppm H2O	parts per million water	sd/org/d	seeds per organism per day
ppm/organi	parts per million per organism	s/g	seconds per gram
ppm soil	parts per million soil	s/h	seconds per hour
ppm/eu	parts per million per experimental unit	SFU	sigma Frankel units
		sgth:thik	Strength to thickness ratio
		sgth:wght	Strength to weight ratio
		sigma u/100ml	sigma units per 100 milliliters
		SL unit	SL unit
prdt/mi/mg pro	product formed per minute per milligram protein	so:gr	ratio shoot to grain
pt	pints	so:ro	ratio shoot to root
pt/ac	pints per acre	SP:BR	spleen to brain ratio
		species	species
q/ha	quintals per hectare (1 quintal = 100 kilograms)	spines/ u area	spines per unit area
		str:gr	ratio plant straw to grain
		succ br	successful broods
		succ br/fm	successful broods per female
[RA]	[ratio: use the number, no unit needed]	T3:T4	Ratio of triiodothyronine (T3) to thyroxine (T4)
R	weight/(length x width) an index of eggshell quality	t/ha	tons per hectare
		t/ha gr/t/ha gr + str	tons per hectare grain plus straw
RA 1e-3	ratio * 1e-3	taxa	taxa
RA/wk	ratio per week	TE:BR	testes to brain ratio
rate/100 org	rate per 100 organisms		
rate/mi	rate per minute	tillers/m2	tillers per square meter
rev	revolutions	tons/acre	tons per acre
rev/h	revolutions per 5 hours	top:root	ratio plant tops to roots
RF units	RF units	treated:cntl	ratio treated to control
rgv	relative gray value	TS:BR	thymus to brain ratio
RI	Ratcliffe index (shell wt/egg	u	units
	length x width mm2)	u2	square microns
RNA:protein	RNA to protein ratio	u3	cubic microns
ro/so	root to shoot ratio	u act	unit activity (an increase in absorbance at 555 nm of 0.100, with a 1.0 cm light path, per milliliter of erythrocytes per hour, at 38 C).
rpm	revolution per minute		
RR	Centric fusions		
RSA/TI	relative specific activity per tissue		
RV:TV	ratio of right ventricle to		

u act/h	unit activity per hour		microliter
u eq/g pro/mi	microatom equivalents per gram protein per minute	ueq/l	microequivalents per liter
		ueq/g	microequivalents per gram
		ug	micrograms
u/co2/50mg/10mi	units per carbon dioxide per 50 milligrams per 10 minutes	ug%	micrograms percent
		ug chl/cm2	micrograms chlorophyll per square centimeter
u/d	units per day	ug chl/ mg leaf	micrograms chlorophyll per milligram of leaf
u/mg N2	units per mg N2	ug CO2/g d sl/h	micrograms carbon dioxide per grams dry soil per hour
u/mg TI	units per milligram tissue	ug enz/g/h	microgram enzyme per gram per hour
U/ml	Units per milliliter	ug frmzn/100g	micrograms formazan formed per 100 grams tissue
U/ml RBC	units per milliliter red blood cells		(formazans: Coloured azo compounds formed by the reduction of tetrazolium salts. Employing this reaction, oxidoreductase activity can be determined quantitatively in tissue sections by allowing the enzymes to act on their specific substrates in the presence of tetrazolium salts.
U of fl	units of fluorescence		
u/g	units per gram		
u/l	units per liter		
u/mg	units per milligram		
U/mg pro	units per milligram protein		
u/ml	units per milliliter		
u/TI	units per tissue		
U/0.2 ml	units per 0.2 milliliters		
uBq	microBecquerels		
uCi	microcuries		
uCi/100g org	microcuries per 100 grams organism	ug GHA/1e+6 c/h	micrograms gamma-glutamylhydroxamate per 1X10 +6 cells per hour
uCi/3.6mg	microcuries per 3.6 milligrams	ug N/g	micrograms nitrogen per gram.)
uCi/30mg	microcuries per 30 milligrams	ug NANA/TI	micrograms N-acetyl neuraminic acid per tissue
uCi/L	microcuries per liter	ug Pi/mg	micrograms Pi/milligram
uCi/g	microcuries per gram	ug Pi/mg MIT	micrograms Pi/milligram mitochondria
uCi/g org	microcuries per gram organism	ug POH/mg pro/m	micrograms phenol per milligrams protein per minute
uCi/g soil	microcuries per gram soil	ug pro ld/he	ug proteolipid per nerve pair
uCi/kg	microcuries per kilogram	ug TTC/mg pro/h	micrograms triphenyl tetrazolium chloride reduced per milligram
uCi/mg	microcuries per milligram		micrograms per 0.1 milliliter per day per organism
uCi/ml	microcuries per milliliter	ug/0.1 ml/d/org	micrograms per 0.5 grams
uCi/nmol	microcuries per nanomoles	ug/0.5g	micrograms per 10 grams
uCi/org	microcuries per organism	ug/10 g bdwt	body weight
uCi/ug	microcuries per microgram	ug/100g	micrograms per 100 grams
uCi/ul	microcuries per microliter	ug/100 g bdwt	micrograms per 100 grams body weight

ug/100g/d	micrograms per 100 grams per day	ug/fish	micrograms per fish
ug/100g org/d	micrograms per 100 grams organism per day	ug/g	micrograms per gram
ug/100 mg	micrograms per 100 milligrams	ug/g ash	micrograms per gram ash
ug/100mg/30mi	micrograms per 100 milligrams per 30 minutes	ug/g bdwt	micrograms per gram body weight
ug/100mg/h	micrograms per 100 milligrams per hour	ug/g bdwt/d	micrograms per gram body weight per day
ug/100ml	micrograms per 100 milliliters	ug/g bdwt/wk	micrograms per gram body weight per week
ug/100ml RBC	micrograms per 100 milliliters red blood cells	ug/g dry cmpst	micrograms per gram dry compost
ug/200mg/20mi	micrograms per 200 milligrams per 20 minutes	ug/g dry wt	micrograms per gram dry weight
ug/200mg/30mi	micrograms per 200 milligrams per 30 minutes	ug/g d soil	micrograms per gram dry soil
ug/24h	micrograms per 24 hours	ug/d diet	micrograms per gram diet
ug/24h/org	micrograms per 24 hours per organism	ug/g food	micrograms per gram food
ug/ 4d	micrograms per 4 days	ug/g npro	micrograms per gram nonprotein
ug/50ul	micrograms per 50 microliters	ug/g om	micrograms per gram organic matter
ug/72h	micrograms per 72 hours	ug/g org	micrograms per gram organism
ug/500g	micrograms per 500 grams	ug/g org/d	micrograms per gram organism per day
ug/bee	micrograms per bee	ug/g org/wk	micrograms per gram organism per week
ug/cell	micrograms per cell	ug/g org x 1E2	micrograms per gram organism x 1E2
ug/cm2	micrograms per centimeter squared	ug/g pro	micrograms per gram protein
ug/cm2/d	micrograms per square centimeter per day	ug/g soil	micrograms per gram soil
ug/cm3	micrograms per cubic centimeter	ug/g tissue	micrograms per gram tissue
ug/d	micrograms per day	ug/g wet wt	micrograms per gram wet weight
ug/d/org	micrograms per day per organism	ug/g/d	micrograms per gram per day
ug/disk	micrograms per disk	ug/g/wk	micrograms per gram per week
ug/dl	micrograms per deciliter	ug/h/100 g	micrograms per hour per 100 grams
ug/dm3	micrograms per cubic decimeter	ug/kg	micrograms per kilogram
ug/egg	micrograms per egg	ug/kg bdwt	micrograms per kilogram body weight
ug/eu	micrograms per experimental unit	ug/kg bdwt/d	micrograms per kilogram body weight per day
ug/eu/d	micrograms per experimental unit per day	ug/kg/d	micrograms per kilogram per day
		ug/kg fd	micrograms per kilogram food
		ug/kg LD	micrograms per kilogram lipid
		ug/kg org	micrograms per kilogram organism
		ug/kg org/d	micrograms per kilogram organism per day

ug/kg soil	organism per day micrograms per kilogram soil	ul Eq/ml	dioxide per 50 milligrams tissue per 10 minutes
ug/kg TI	micrograms per kilograms tissue	ul O2/g/h	microliters equivalents per milliliter
ug/l	micrograms per liter	ul O2/hr/g	microliters O2 per gram per hour
ug/l/d	micrograms per liter per day	ul O2/mi/g	microliters oxygen per hour per gram
ug/mg	micrograms per milligram	ul/egg	microliters oxygen per minute per gram
ug/mg food	micrograms per milligram food	ul/g	microliters per egg
ug/mg MIT	micrograms per milligram mitochondria	ul/g bdwt	microliters per gram microliters per gram body weight
ug/mg pro	micrograms per milligrams protein	ul/g/h	microliters per gram per hour
ug/mg pro/hr	micrograms per milligram protein per hour	ul/kg	microliters per kilograms
ug/mg TI	micrograms per milligram tissue	ul/L	microliter per liter
ug/mi/mg pro	micrograms per minute per milligram protein	ul/ml	microliter per milliliter
ug/min/ml	micrograms per minute per milliliter	uM	microMolar
ug/ml	micrograms per milliliter	um/s	micrometers per second
ug/ml H2O	micrograms per milliliter water	um2	micromoles squared
ug/org	micrograms per organism	um3	cubic micromoles
ug/org/d	micrograms per organism per day	um3	cubic micrometers or cubic microns
ug/tank/wk	micrograms per tank per week	um3/cell	cubic micrometers per cell
ug/TI	micrograms per tissue	uM/cm3	micromoles per squared centimeter
ug/ul	micrograms per microliter	uM/h/l RBC	micromoles per hour per liter red blood cells
ulU/ml	microInternational units per milliliter	um/g/30mi	micromoles per gram per 30 minutes
ul	microliter	uM/h/mg pro	micromolar per hour per milligram protein
ul3	cubic microliters	uM/kg	micromolar per kilogram
ul/100ml	microliter per 100 millimeter	uM/kg wght	micromolar per kilogram weight
ul/20ml	microliter per 20 millimeter	uM/l	microMolar (micromoles per liter)
ul/beat/kg	microliters per beat per kilogram	uM/mg pro	micromoles per milligram protein
ul/cm2	microliter per square centimeter	uM/min/g	micromoles per minute per gram
ulCO2/50mgTI/10	microliters carbon	uM/ml	micromolar per milliliter
		um/TI	micromoles per tissue
		uM BAPNA/mi/mgP	micromoles of BAPNA (benzoylarginie-p-nitroanilide)
			inhibited per minute per milligram protein
		uM BAPNA/mi/ml	micromoles of BAPNA (benzoylarginie-p-nitroanilide)

	inhibited per minute per milliliter			per gram tissue
uM BTEE/mi/mgP	micromoles BTEE (N-benzyl-L-tyrosine ethyl ester) per minute per milligram protein	umol Pi/mgp/30m		micromoles Pi per milligram protein per 30 minutes
uM P/g	micromoles Phosphorus per gram	umol Pi/mgpro/h		micromoles Pi per milligram protein per hour
uM SAPNA/mi/mgP	micromoles of SAPNA (succinyl-1-(ala)3-p-nitro anilide) inhibited per minute per milligram protein	umol pyv mg p/h		micromoles pyruvate per milligram protein per hour
		umol/100g		micromoles per 100 grams
		umol/100g org		micromoles per 100 grams organism
		umol/100 ml		micromoles per 100 milliliters
		umol/10g/h		micromoles per 10 grams per hour
uM SAPNA/mi/ml	micromoles of SAPNA (succinyl-1-(ala)3-p-nitro anilide) inhibited per minute per milliliter	umol/10mg/h		micromoles per 10 milligrams per hour
		umol/20mi/g		micromoles per 20 minutes per gram
uM TAME/mi/mgP	micromoles TAME (toluenesulfonyl-L-arginine methyl ester) per minute per milligram protein	umol/dl/h		micromoles per decaliter per hour
		umol/dm3		micromoles per cubic decimeter
umol	micromoles	umol/eu		micromoles per experimental unit
umol ASCA/mg pro	micromoles ascorbic acid per milligram protein	umol/g		micromoles per gram
		umol/g ash		micromoles per gram ash
		umol/g pro/h		micromoles per gram protein per hour
umol C2H4/g/h	micromoles of ethylene produced per gram per hour	umol/g soil		micromoles per gram soil
		umol/g TI		micromole per gram tissue
umol C2H4/org/h	micromoles of ethylene produced per organism per hour	umol/g wet wt		micromoles per gram wet weight
		umol/g/h		micromoles per gram per hour
umol CO2/m2/s	micromoles CO2 per square meter per second	umol/g/mi		micromoles per gram per minute
umol CO2/g/s	micromoles CO2 per gram per second	umol/g/15 mi		micromoles per gram per 15 minutes
umol CO2/g ch/s	micromoles carbon dioxide per gram chlorophyll per second	umol/h/g pro		micromoles per hour per grams protein
		umol/h/g TI		micromoles per hour per gram tissue
umol GH/mgpro/m	micromoles reduced glutathione per milligram protein per minute	umol/h/TI		micromoles per hour per tissue
umol NADPH/mg P	micromoles NADPH per milligram protein per minute	umol/h/mg pro		micromoles per hour per milligram protein
		umol/kg		micromoles per kilogram
umol P/mg pro/h	micromoles phosphorus per milligram protein per hour	umol/kg media		micromoles per kilogram media
		umol/kg org		micromoles per kilogram organism
umol Pbg/h/g	micromoles of porphobilinogen per hour	umol/l		micromoles per liter

umoles/l agar	micromoles per liter agar	uu/ml	microunits per milliliter
umol/l RBC/mi	micromoles per liter red blood cells per minute	uV	microvolts
umol/m	micromoles per meter	V	response value
umol/mg	micromoles per milligram	V/N	response value per number of response sites
umol/mg/20	micromoles per milligram per 20 minutes	V/quadrant v/v	response value per quadrant volume per volume
umol/mg pro	micromoles per milligram protein	WER	water efficiency ratio
umol/mgpro/20 mi	micromoles per milligram protein per 20 minutes	wght/lit	weight per litter
		wk	week
		WO:LI	whole organism to liver ratio
umol/mg pro/h	micromoles per milligram protein per hour	[1/h]	[one per hour: use /h]
umol/mg/h	micromoles per milligram per hour	[10x2/mm3]	[10x2 cubic millimeters:use /mm3]
umol/mg/mi	micromoles per milligram per minute	[10x3/mm3]	[10x3 cubic millimeters:use /mm3]
umol/mi	micromoles per minute	[10x6/ml3]	[10x6 cubic milliliters: use /mm3]
umol/mi/g	micromoles per minute per gram	[10x6/mm3]	[10x6 cubic millimeters:use /mm3]
		[10x6/ul]	[10x6 microliters:use /ul]
		[10x9/l]	[10x9 liters:use /l]
umol/mi/h	micrograms per minute per hour	1mg/10ml	1 milligram per 10 milliliters
umol/mi/l	micromoles per minute per liter	1e+1 kg	1 x 10+1 kilograms
umol/mi/mg pro	micromoles per minute per milligram protein	1e+1 ug/g	1 X 10 +1 micrograms per gram
umol/mi/ml	micromoles per minute per milliliter	1e+2 cal/g	1 X 10 +2 calories per gram
umol/ml/mi	micrograms per milliliter per minute	1e+2 no/mm2	1 x 10 +2 per square millimeter
umoles/g TI/h	micromoles per gram tissue per hour	1e+2 ug/g	1 X 10 +2 micrograms per gram
umolNH3/1e+6c/h	micromoles NH3 per 1X10+6 cells per hour	1e+3 cell/mg TI	1 X 10 +3 cells per milligram tissue
units/100ml	units per 100 milliliters	1e+3 cells	1 X 10 +3 cells
units/l	units per liter	1e+3 cm/d	1 X 10 +3 centimeters per day
units/mg pro	units per milligram protein	1e+3dpm/mg DNA	1 x 10+3 disintegrations per minute per milligram DNA
unit/mg pro/mi	enzyme unit per milligram protein per minute	1e+3dpm/mg RNA	1 x 10+3 disintegrations per minute per milligram RNA
		1e+3 dpm/TI	1 X 10 +3 disintegrations per minute per tissue
uu/mg	microunits per milligram	1e+3 no	1 X 10 +3 number
uU/ml	microunits per milliliter	1e+3 no/cm	1 X 10 +3 number per centimeter
uu/mi/ml	microunits per minute per milliliter	1e+3 no/cm3	1 X 10 +3 number per cubic centimeter

1e+3 no/mg SP	1 X 10 +3 number per milligram spleen	1e+7/ml sperm	1 X 10+7 cells per milliliter sperm
1e+3 RA	1 X 10 +3 ratio	1e+8/mm3	1 x 10+8/cubic millimeters
1e+3 um2	1 X 10 +3 square micrometers	1e+8 no	1 x 10+8 number
1e+3RNA/TCA/DNA	1 X 10 +3 (counts per minute TCA per milligram RNA) per milligram DNA	1e+9 no/l	1 X 10 +9 number per liter
1e+3/ml	1 X 10+3/milliliter	1e+9 no/ml	1 X 10 +9 number per milliliter
1e+3/mm3	1 X 10+3/cubic millimeter	1e-1 mg/mg/d	1 X 10 -1 milligrams per milligrams per day
1e+3 no	1 x 10+3 number	1e-2 mm	1 x 10-2 millimeters
1e+3 no/ul	1 x 10+3 number per microliter	1e-2 Nm	1 x 10-2 nanometers
1e+3/ul	1 X 10+3/microliter	1e-2 ug/g	1 X 10 -2 micrograms per gram
1e+4 IU/TI	1 X 10 +4 International units per tissue	1e-2 J/beat/kg	1 x 10 -2 Joules per beat per kilogram
1e+4 no/mg TI	1 x 10+4 number per milligram tissue	1e-3 cpm	1 x10-3 counts per minute
1e+4 no/ml	1 X 10 +4 number per milliliter	1e-3 mg/mg/d	1 X 10 -3 milligrams per milligrams per day
1e+4 ug/g	1 x 10+4 micrograms per gram	1e-3 RA	1 X 10 -3 molar
1e+4 ug/TI	1 X 10+4 micrograms per tissue	1e-4dpm/g	1 x 10-4 disintegrations per minute per gram
1e+4/mm	1 x 10+4/millimeter	1e-4dpm/mg Pi	1 x 10-4 disintegrations per minute per milligram Pi
1e+4/mm3	1 x 10+4 per cubic millimeter	1e-5/mm3	1 X 10 -5/cubic millimeter
1e+12 no/L	1 X 10+12 number/liter	1e-2M	1 X 10-2 molar
1e+5 no	1 X 10 +5 number	1e-3M	1 X 10-3 molar
1e+6 cells	1 X 10 +6 cells	1e-4M	1 X 10-4 molar
1e+6 cm	1 X 10 + 6 centimeters	1e-5M	1 X 10-5 molar
1e+6/ml	1 X 10+6/milliliter	1e-6M	1 X 10-6 molar
1e+6/mm3	1 X 10+6/cubic millimeter	1e-7M	1 X 10-7 molar
1e+6/ul	1 X 10+6/microliter		
1e+6 no	1 x 10+6 number		
1e+6 no/ul	1 x 10+6 number per microliter		
1e+6 no/cm3	1 X 10 +6 number per cubic centimeter		
1e+6 no/g TI	1 x 10+6 number per gram tissue		
1e+6 no/mm3	1 X 10 +6 number per cubic millimeter		
1e+6 no/org	1 x 10+6 number per organism		

Appendix O. Ionic Fraction Codes

Actinium	Ac	Gallium	Ga	Protactinium	Pa
Aluminum	Al	Germanium	Ge	Radium	Ra
Americium	Am	Gold	Au	Radon	Rn
Ammonia		Hafnium	Hf	Rhenium	Re
(un-ionized)	NH ₃	Hydrogen Cyanide	HCN	Rhodium	Rh
Ammonium		Hydrogen sulfide ion	HS-	Rubidium	Rb
(total)	NH ₄	Helium	He	Ruthenium	Ru
Ammonium nitrate	NO ₃ N	Holmium		Samarium	Sm
Ammonium nitrite	NO ₂ N		Ho	Scandium	Sc
Antimonate	SbO ₄	Hydrogen	H	Selenate	SeO ₄
Antimony	Sb	Indium	In	Selenite	SeO ₃
Argon	Ar	Iodine	I	Selenium	Se
Arsenate	ASO ₄	Iridium	Ir	Silicate	SiO ₂
Arsenic	As	Iron	Fe	Silicon	Si
Astatine	At	Krypton	Kr	Silver	Ag
Azide	N ₃	Lanthanum	La	Sodium	Na
Barium	Ba	Lawrencium	Lr	Sodium Azide	NaN ₃
Berkelium	Bk	Lead	Pb	Strontium	Sr
Beryllium	Be	Lithium	Li	Sulfate	SO ₄
Bismuth	Bi	Lutetium		Sulfur	S
Borate	BO ₃		Lu	Tantalum	Ta
Borate	B ₂ O ₃	Magnesium	Mg	Technetium	Tc
Boron	B	Manganate	MnO ₄	Tellurium	Te
Bromate	B ₄ O ₇	Manganese	Mn	Terbium	Tb
Bromate	BrO ₃	Mendelevium	Md	Thallium	Tl
Bromine	Br	Mercury	Hg	Thiocyanate	SCN
Cadmium	Cd	Methylmercury	MeHg	Thiosulfate	S ₂ O ₃
Calcium	Ca	Molybdate	MoO ₄	Thorium	Th
Californium	Cf	Molybdenum	Mo	Thulium	Tm
Carbon	C	Neodymium	Nd	Tin	Sn
Cerium	Ce	Neon	Ne	Titanium	Ti
Cesium	Cs	Neptunium	Np	Total Residual Bromine	TRBr
Chlorine	Cl	Nickel	Ni	Total Residual Chlorine	TRCl
Chlorine produced oxidant		Niobium	Nb	Total Residual Oxidant	TROX
	CPOX	Nitrate	NO ₃ -	Triethyl lead	Pb ₃ E
Chlorate	ClO ₃	Nitrite	NO ₂	Tributyltin	TBT
Chlorite	ClO ₂	Nitrogen	N	Tributyltin oxide	TBTO
Chromium	Cr	Nobelium	No	Tungstate	WO ₄
Chromate	Cr ₂ O ₇	Not reported	NR	Uranium	U
Chromate (+6)	CrVI	Osmium		Uranium oxide	
Cobalt	Co		Os	(Uraninite)	UO ₂
Copper	Cu	Oxygen	O	Vanadium	V
Curium	Cm	Palladium	Pd	Wolfram	W
Cyanide	CN	Paraquat	PQT	Xenon	Xe
Dysprosium	Dy	Pentachlorophenol	PCP	Ytterbium	Yb
Einsteinium	Es	Perchlorate	ClO ₄	Yttrium	Y
Erbium	Er	Phosphorus	P	Zinc	Zn
Europium	Eu	Platinum		Zirconium	Z
Fermium			Pt		
	Fm	Plutonium	Pu		
Fluorine	F	Polonium	Po		
Francium	Fr	Potassium	K		

Gadolinium	Gd	Praseodymium Promethium	Pr Pm	
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Appendix P. Chemical Analysis Methods

Code	Definition	Description
M	Measured	Clearly states in the paper that the concentrations reported by the author were measured.
U	Unmeasured	Author clearly identifies that the concentrations are based on nominal values, or the author presents concentration information, but does not report information that chemical analysis was conducted.
NR	Not Reported	Author describes methods for analyzing chemical concentrations, but it is not clear that the values presented are based on measured or nominal concentrations.
X	Unmeasured (some measured values reported in article)	Author clearly identifies that some of the concentrations are based on nominal values while other concentrations are based on measured values, with the original nominal values also reported. Record the nominal values in the dose data field.

**Appendix Q. Sample Unit Codes
for Section V.5. Results Information**

Code	Definition
AB	A bove ground portion (plants)
AD	A dult
BH	B oth male and female organisms exposed or observed
BR	B rood
C1	First Clutch
C2	Second Clutch
CC	C ocoons
CL	C ells
CB	Combs
CT	C ontainers
DC	D eceased organism
EG	E gg
EM	E mbryo
EU	E xperimental u nit
F1	F 1 generation
F2	F 2 generation
F3	F 3 generation
F4	F4 generation
FET	Fetus
FB	Mature, full- b loom (fruit trees)
FF	F ields (as in agriculture)
FG	F emale g ametophyte

Code	Definition
FL	F lower(s)
FM	F emale organisms
FX	multiple generations
G1	females, 1 st generation
G2	females, 2 nd generation
G3	females, 3 rd generation
GR	G rains
GS	G erminated seed
HC	H oney comb
HT	H atchling
JV	J uvenile
KR	K ernal
LE	L eam
LE1	1 st leaf
LE2	2 nd leaf
LE3	3 rd leaf
LE4	4 th leaf
LE5	5 th leaf
LE6	6 th leaf
LE7	7 th leaf
LE8	8 th leaf
LT	L itters
LV	L arvae
M1	males, 1 st generation

Code	Definition
M2	males, 2 nd generation
M3	males, 3 rd generation
MD	M ature d ormant
MG	M ale g ametophyte
ML	M ale organisms
MT	M ature, no specified stage
MU	M ultiple
MX	males, multiple generations
NF	Non-pregnant females
NR	Applicable information about the organisms was N ot R eported
NT	N est
OR	O rganism
PB	Mature, p ost- b loom (fruit trees)
PF	Pregnant females
PH	Mature, p it- h ardening (fruit trees)
PL	P lots
PR	P air
RB	Mature r eproductive, 2nd generation
RC	Mature r eproductive, 3rd generation
RO	R oot
RP	Mature r eproductive
RS	R oot s egments
SA	S ubadult
SC	2nd generation (M2), no spec.stage

Code	Definition
SD	S eed
SG	Mature, s ide- g reen (fruit trees)
SHL	Shell
SL	S eedling
SM	Samples
SV	S urvivor
TC	T issue c ulture callus
TU	T ubers
VC	V egetative c lone
VG	Mature v egetative

Appendix R. Effect Group Codes and Definitions

GROUP/EFFECT CODE(S)	DEFINITION
ACC/ACC	Accumulation: Effects, measurements and endpoints which characterize the process by which chemicals are taken into and stored in plants or animals. Includes lethal body burden.
BEH/AVO, BEH, FDB	Behavior: Overt activity of an organism represented by three <i>effect</i> groups - avoidance, general behavior, and feeding behavior. All measurements related to reproductive behavior are listed under the major effect group REP.
BCM/BCM, ENZ, HRM,	Biochemical: measurement of biotransformation or metabolism of chemical compounds, modes of toxic action, and biochemical responses in plants and animals including three <i>effect</i> groups - biochemical, enzyme and hormone effects.
CEL/CEL, GEN, HIS	Cellular Effects: measurements and endpoints regarding changes in structure and chemical composition of cells and tissues of plants or animals as related to their functions; the three <i>effect</i> groups include cellular, genetic and histological effects.
GRO/DVP, GRO, MPH	Growth: a broad category which encompasses measures of weight and length and includes effects on development, growth and morphology. Development covers toxicant effects on tissue organization in growing progeny. Growth represents length and weight changes at any point in the life cycle. Morphology measurements and endpoints address the structure (bones) and form (organ/tissue development) of an organism at any stage of its life history.
MOR/MOR	Mortality: measurements and endpoints where the cause of death is by direct action of the chemical.
PHY/INJ, IMM, ITX, PHY	Physiology: measurements and endpoints regarding basic activity in cells and tissues of plants or animals. Four <i>effect</i> groups include injury, immunity, intoxication and general physiological response.
POP/POP	Population: measurements and endpoints relating to a group of organisms or plants of the same species occupying the same area at a given time.
REP/ REP, AEG	Reproduction: measurements and endpoints to track the effect of toxicants on the reproductive cycle. All measurements related to reproduction and care of progeny are included in this category, including behavioral and physiological measurements. Measurements related to development of progeny are found under the major <i>effect</i> group GRO, minor <i>effect</i> group DVP. The <i>effect</i> group AEG includes measurements of avian or reptilian eggs.
SYS/PRS	Ecosystem: measurements and endpoints to track the effects of toxicants on ecosystem processes. Includes microbial processes.
NOC/NOC	No Group Code: measurements related to multiple or delayed effects or endpoints reported without a specific effect.

Appendix S. Group Effect, Effect and Measurement Codes and Definitions

Note: Codes in < > need maintenance and should not be used for coding at this time.

ACC ACCUMULATION GROUP		
ACC ACCUMULATION EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ASML	Assimilation of test chemical	The conversion of nutrient or chemical into the fluid or solid substance of the body, by the processes of digestion and absorption, whether in plants or animals (Gray's on-line medical dictionary)
<BDBN>	Body Burden	Should be coded as RSDE. If this measurement is associate with an endpoint, should be changed to LBCN or EBCN.
ELIM	Elimination	General term for loss or disappearance of a substance from an organism by either passive or active transport mechanism, e.g. diffusion and metabolic transformation.
GACC	Accumulation, General	Used when more than one measurement is coded for an ACQUIRE record..
LBCN	Lethal Body Concentration	Also Lethal Body Burden. The body residue of a chemical that is associated with mortality.
RATO	Ratio	Ratio of accumulated substance between two response sites, but not the whole organism.
<RCVY>	Recovery of Lead Shot	
RSDE	Residue	Amount of test chemical remaining in tissue after exposure. This includes body burden or body concentrations. This also includes autoradiography results.
TSLC	Translocation	the conduction of the test substance from one part of an organism to another
UPTK	Uptake	The fraction of total available chemical in a medium (food, water) that is transferred to the organism (measured as the incoming - outgoing concentrations) OR a process by which materials are transferred into and onto an organism.

BEH BEHAVIOR GROUP		
AVO AVOIDANCE EFFECT		
Measurement Code	Measurement Name	Measurement Definition
CHEM	Chemical Avoidance	Avoidance or attraction to a chemical gradient.
FOOD	Food Avoidance	Avoidance or attraction to a chemical gradient in food.
GAVO	Avoidance, General	Unknown or multiple types of avoidance responses..
STIM	Stimulus Avoidance	Avoidance or attraction to a stimulus.
WATR	Water Avoidance	Avoidance or attraction to a chemical gradient in water.
BEH BEHAVIOR EFFECT		
ACTP	Accuracy of Learned Task, Performance	
ACTV	Activity, General	
ADOT	Adopt/adoption	Voluntary acceptance of the offspring of other parents to be as one's own offspring (Gray's)
AGCL	Aggregation/Clumping	Grouped with the other organisms; aggregating in a group
AGGT	Aggression	Hostile, injurious, or destructive behavior or outlook especially when caused by frustration (MW online).
APCH	Approach	To make advances to especially in order to create a desired result, to come very near to (www.m-w.com)
ATCL	Antennal Cleaning	
ATSK	Acquired task	Ability to learn a new task
ATTK	Attack, attacking	to threaten with immediate injury or capture
BBBH	Burrow or Burial Behavior	
BITE	Bite or biting	To seize with the teeth.
BOBB	Bobbing	to move up and down in a short quick movement
BOWW	Bow, bowing	to bend the head, body, or knee
BWAX	Bees Wax Produced	
CASE	Case Leaving Behavior	Change in number of organisms emerging from a casing.

BEH BEHAVIOR EFFECT		
CMST	Compactness of Swimming Track	
CNBL	Cannibalism	Eating other individuals of one's own species. (cancerweb.ncl.ac.uk)
COMA	Colony Maintenance (Bees)	
COMB	Comb Built	
CRDN	Coordination	Harmonious functioning of muscles or groups of muscles in the execution of movements.(www.m-w.com)
CRTP	Continual reinforcement task performed	Performance of a task under continual reinforcement
DHST	Diameter of Helix of Swimming Track	
DIGG	Dig/digging	to advance by removing or pushing aside material (Webster's)
DPLY	Displaying Behavior	
DRMT	Dormant, Adverse Condition Response	
DTCH	Ability to Detach from Substrate	Change in ability of an organism to detach from or attach to a substrate.
DUMV	Diurnal movements	Movements made during the day
ECMB	Empty Combs	
EQUL	Equilibrium	Change in ability to maintain balance.
EXTN	Extinction	time it takes for a behavior to cease
FLIT	Flight	Behaviors include flag, evade, retreat, flee, freeze, defensive upright posture, defensive sideways posture and oblique (Ref 58432)
FLTR	Filtration Rate	Change in rate of filtration.
FLYG	Flying Behavior	
FOOT	Foot Retraction	
FRTTP	Fixed ratio task performed	A task performed under fixed ratio reinforcement
FRZG	Freezing Behavior	The act of stopping motion brought on by a stimulus.
FTTR	Flutter	to move with quick wavering or flapping motions

BEH BEHAVIOR EFFECT		
GBHV	Behavioral Changes, General	Quantifiable change in activity including trained behavior.
<GPRD>	Production, General	
GRAB	Grab, grabbing	to take or seize by or as if by a sudden motion or grasp
GROM	Grooming	An animal's cleaning and caring for the body surface. This includes preening, the cleaning and oiling of feathers with the bill or of hair with the tongue. (http://cancerweb.ncl.ac.uk)
HMVT	Horizontal movements	Movements from side to side or on the horizontal plane
HONY	Honey Produced	
INST	Sleeping Time, Induced	
JUMP	Jumping	To spring into the air : leap; especially : to spring free from the ground or other base by the muscular action of feet and legs (www.m-w.com)
KILL	Kill	One organism killing another organism
LOCO	Distance Moved, Change in Direct Movement	Quantifiable change in direct movement .
MIGR	Migration	Quantifiable change in migration behavior.
MOTL	Motility	
NACT	Non-social activity	Behaviors include explore, scan, dig, push-dig, wash, self-groom, scratch, jump and eat (Ref 58432)
NCMV	Nocturnal movements	Movements made during the night
NMVM	Movements, Number of	
NRES	No response	No response to the toxicant
NVOC	Vocalizations, Number of	
ORNT	Orientation	To set or arrange in any determinate position especially in relation to the points of the compass
PALR	Palmar grasp	Ability to grasp with the palm of a hand.
PHTR	Phototactic Response	Attraction to or avoidance of light.

BEH BEHAVIOR EFFECT		
PLAR	Placing reflex	Flexion followed by extension of the leg (Dorlands Medical Dictionary)
POLC	Pollen collected	Collection of a mass of microspores in a seed plant appearing usually as a fine dust (Websters).
POST	Posture	The position of the limbs or the carriage of the body as a whole. (cancerweb.ncl.ac.uk)
PNPY	Prey penetration	The penetration of a pest into a plant root system.
PRVU	Predator Vulnerability	Quantifiable change in ability to avoid or escape capture.
REST	Rest	A state of motionlessness or inactivity or a bodily state characterized by minimal functional and metabolic activities (www.m-w.com)
RRSP	Righting Response	
RSNR	Resting and not ruminating	Lying down and not chewing cud.
RSPT	Response Time to a Stimulus	
RSRU	Resting and ruminating	Lying down and chewing cud
RUBB	Rub	To move along the surface of a body with pressure
RVSE	Reversals	To turn completely about in position or direction (www.m-w.com)
SACT	Social Activity	Behaviors include attend, nose, groom, sniff, investigate, follow, push-under, push-past, crawl-over and crouch (Ref 58432)
SDNR	Standing and not ruminating	Standing and not chewing cud
SDRU	Standing and ruminating	Standing and chewing cud
SEBH	Search/explore behavior	An active movement by which an organism seek resources. (http://www.colostate.edu/Depts/Entomology/courses/en507/student_papers_1995/bradbury.html)
SLEP	Sleep/Sleeping	the natural periodic suspension of consciousness during which the powers of the body are restored (Webster's)
SMEL	Smell/Sniff	to perceive the odor or scent of through stimuli affecting the olfactory nerves (Webster's)
SRCH	Stretch	To enlarge or distend especially by force. (Webster's)
SRED	Spread, Spreading	to stretch out

BEH BEHAVIOR EFFECT		
STLT	Startle	to frighten or surprise suddenly (Webster's)
STPY	Stereotypy	Frequent almost mechanical repetition of the same posture, movement, or form of speech (as in schizophrenia) (www.m-w.com)
STRS	Observed Stress	Observed physiological tension or irritation in animals or plants.
SURF	Surfacing	
SWIM	Swimming	
THML	Temperature Tolerance	Change in tolerance to temperature change.
VACL	Valve Closure	Change in the ability to open or close a shell valve upon mechanical stimulation and/or gaping response.
VCLF	Visual Cliff	
VIBR	Vibrissae placing	A sensorimotor reflex. The vibrissae (hair), but not the skin, is manipulated and invokes a relex response.
VISP	Visual placing	The reaction of an organism in response to a visual stimuli. For example: The fast movement of a finger towards a mouse normally elicits an immediate reaction from the mouse. In addition, the mouse is held a few centimeters above a grid (a wire mouse cage top) and should extend its front limbs in an attempt to grasp the grid. This response is known as visual placing. (http://cmhd.mshri.on.ca/pdf)
VMVT	Vertical or rearing movements	To rise up on the hind legs (www.m-w.com)
WTCH	Watch, watching	to keep something under close observation
YAWN	Yawn	to open the mouth wide usually as an involuntary reaction to fatigue or boredom (Webster's)
FDB FEEDING BEHAVIOR EFFECT		
BGNG	Begging Behavior	
FCNS	Food Consumption (Amount or Rate)	
FDNG	Feeding Behavior (Activity)	
FECL	Fecal Production	
FEFF	Feeding Efficiency	
FSTR	Food Storage	

FTIM	Feeding Time	
GFDB	Feeding Behavior, General	
LTBD	Litter Breakdown	
PRBE	Predatory Behavior	Change in ability to seek and capture prey.
STRK	Strikes	Number of times food source was hit.
WCON	Water Consumption	

BCM BIOCHEMICAL GROUP		
BCM BIOCHEMICAL EFFECT		
Measurement Code	Measurement Name	Measurement Definition
1HPY	1-Hydroxypyrene	Main metabolite compound of polycyclic aromatic hydrocarbons with four to six rings (ECOREF#50442)
25HC	25-Hydroxycholecalciferol	A 3,25-diol; the first step in the biological conversion of vitamin D3 to the more active form, calcitriol; it is more potent than vitamin D3. Synonym: calcidiol, calcifediol. (cancerweb.ncl.ac.uk)
3MTA	3-Methoxytyramine	A metabolite of dopamine
4ORA	4-Oxo-retinoic acid	An oxidative metabolite of retinoic acid. A highly active endogenous active retinoid. (http://www.niwi.knaw.nl/elecpubl/imwo/niob/niobb.htm)
5HAA	5-Hydroxyindole Acetic Acid	A product of serotonin metabolism excreted by patients with carcinoid tumors. (5-HIAA.)
AABA	Alpha-aminobutyric Acid	Inhibitory amino acid - alpha form of GABA
AAIB	A-Aminoisobutyrate	A group of compounds that are derivatives of the amino acid 2-amino-2-methylpropanoic acid. (Gray's)
ABPT	Androgen binding protein	A protein secreted by testicular Sertoli cells along with inhibin and mullerian inhibiting substance. Androgen binding protein probably maintains a high concentration of androgen in the seminiferous tubules. (http://cancerweb.ncl.ac.uk/omd/contents)
ACAR	alpha-Carotene	One of several orange or red crystalline hydrocarbon pigments C40H56 that occur in the chromoplasts of plants and in the fatty tissues of plant-eating animals and are convertible to vitamin A

BCM BIOCHEMICAL EFFECT		
ACHL	Acetylcholine	A reversible acetic acid ester of choline, and a cholinergic agonist serving as a neurotransmitter (ACh).
ACHP	Acid-soluble hydroxyproline	Specific proline residues on the amino side of a glycine residue in collagen become hydroxylated at C4, before the polypeptides become helical, by the activity of prolyl hydroxylase. This enzyme has a ferrous ion at the active site and a reducing age
ACID	Acid Produced	
ACRR	Acetylene Reduction Rate/plant Roots Nodulated	
ACTN	Actin	A muscle protein that is the chief constituent of the Z-band myofilaments of each sarcomere.
ADNY	Adenvlate	An enzyme that catalyzes the formation of cyclic AMP from ATP (MW on-line)
ADOX	Adenosine diphosphate to oxygen ratio	The ratio of adenosine diphosphate to oxygen
ADPT	Adenosine diphosphate (ADP)	A neucleotide, the 5'-pyrophosphate of adenosine, involved in energy metabolism. It is produced by hydrolysis of ATP and converted back to ATP by the process of oxidative phosphorolation and substrate phosphorolation
AGLB	alpha-Globulins	A simple globular protein which cannot be dissolved in pure water but which can be dissolved if a salt is added to the water. It can also be precipitated out of solution and into a solid with a solution of ammonium sulphate at 50% saturation (Graylab on-line medical dictionary).
AGPT	alpha-glycerophosphate	A salt or ester of either of the glycerophosphoric acids.
AIHP	Acid-insoluble hydroxyproline	Specific proline residues on the amino side of a glycine residue in collagen become hydroxylated at C4, before the polypeptides become helical, by the activity of prolyl hydroxylase. This enzyme has a ferrous ion at the active site and a reducing age
AION	Anions	Negatively charged atoms or radicals.(http://cancerweb.ncl.ac.uk/)
ALAN	Alanine	A neutral amino acid occurring in two forms alpha and beta.
ALBE	Albumen Energy	Albumin - any protein that is soluble in water and moderately concentrated salt soln, and is coagulable by heat.

BCM BIOCHEMICAL EFFECT		
ALBM	Albumin	any of numerous simple heat-coagulable water-soluble proteins that occur in blood plasma or serum, muscle, the whites of eggs, milk, and other animal substances and in many plant tissues and fluids (Webster's).
ALCO	Aluminum Content	
ALGL	Albumin:Globulin ratio	The ratio of Albumin to Globulin in a sample
ALLA	Allantoin	A crystallizable oxidation product of uric acid found in allantoinic and amniotic fluids and in fetal urine.
ALLT	Allantoic Acid	A crystallizable acid obtained by hydrolysis of allantoin; intermediate product in nucleic acid metabolism.
AMAC	Amino Acid(s), General Term	Any organic comp containing an amino and a carboxyl group.
AMAN	Amino Acid Nitrogen	The nitrogen associated with the amino acids in the body
AMMO	Ammonia	A colorless alkaline gas
AMNH	P-amino Hippurate	A salt of aminohippuric acid, the glycine conjugate of amniobenzoic acid, salt is used to measure the effective renal plasma flow and to determine the functional capacity of the tubular excretory mechanism (PAH or PAHA).
AMNN	Amino Nitrogen	Nitrogen combined with hydrogen in the amino group. Also known as ammonia nitrogen.
AMPT	Adenosine monophosphate (AMP)	A nucleotide, the 5'-phosphate of adenosine, involved in energy metabolism. It is produced by hydrolysis of ATP and converted back to ADP by adenylate kinase. Also called adenylic acid.
ANTH	Anthocyanins	Any of the intensely colored, sap-soluble glycoside plant pigments responsible for most scarlet, purple, mauve, and blue coloring in higher plants.
ANTC	Anthrocyanin	
<AOCN>	Arterial Oxygen Content	Use OCON as measurement and response site ART
APCY	Allophycocyanin	Allophycocyanin (APC) is a large protein (approximate molecular weight 80 kd) containing many fluors. (http://www.drmr.com/abcon/APC.html)
APHT	Alkaline phosphate	

BCM BIOCHEMICAL EFFECT		
APRO	alpha-Proteins	Protein: Any of a group of complex organic compounds which contain carbon, hydrogen, oxygen, nitrogen and usually sulfur, the characteristic element being nitrogen and which are widely distributed in plants and animals.
ARCH	arachidonate	An essential unsaturated fatty acid that humans use to synthesise regulatory molecules such as prostaglandins and thromboxanes. It is found in fatty animal tissue such as egg yolk and liver.
ARGI	Arginine	An amino acid, produced by hydrolysis of proteins.
ASBT	Ascorbate	A salt or ester of ascorbic acid. (Gray's)
ASCA	Ascorbic Acid	Vitamin C. A white, crystalline, water-soluble vitamin found in many plant materials, especially citrus fruit.
ASCN	Arsenic to creatinine ratio	the ratio of arsenic to creatinine
ASCO	Arsenic content	
ASHC	Ash Content	The mass of incombustible material remaining after burning a given coal sample as a percentage of the original mass of coal.
ASPA	Aspartate	A salt of aspartic acid - a nonessential amino acid occurring in proteins.
ASPR	Asparagine	A nonessential amino acid that is the beta-amide of aspartic acid. It is found in most plants, and has diuretic properties. It is used as a culture medium for certain bacteria. (Dorland's)
ATCO	alpha-Tocopherol concentration	One of eight compounds that occur in nature that have vitamin E activity, an essential vitamin that functions as an antioxidant.
ATPT	Adenosine Triphosphate	(ATP) A coenzyme composed of adenosinediphosphate with an additional phosphate group; an important energy compound in metabolism.
7BRF	7-Benzyloxyoxyresorufin	
B2MG	beta2-Microglobulin	A small, nonpolymorphic protein, homologous to the C3 domain of IgG, that is one subunit of class I major histocompatibility antigens.
BACO	Barium content	
BAGA	Bisphenol A glucuronic acid	A major degradation product of bisphenol A subjected to renal excretion (60614)
BCAR	beta-Carotene	One of several orange or red crystalline hydrocarbon pigments C ₄₀ H ₅₆ that occur in the chromoplasts of plants and in the fatty tissues of plant-eating animals and are convertible to vitamin A

BCM BIOCHEMICAL EFFECT		
BCON	Boron Content	
BFCO	Bromoform concentration	A colorless liquid, slightly soluble in water; used in the separation of minerals.
BGLB	beta-Globulins	A simple globular protein which cannot be dissolved in pure water but which can be dissolved if a salt is added to the water. It can also be precipitated out of solution and into a solid with a solution of ammonium sulphate at 50% saturation (Graylab on-line medical dictionary).
BGPR	beta- and gamma-Protein	Protein: Any of a group of complex organic compounds which contain carbon, hydrogen, oxygen, nitrogen and usually sulfur, the characteristic element being nitrogen and which are widely distributed in plants and animals. Proteins, the principal const
BHNC	Behenic Acid	
BIOT	Biotin Content	Biotin - structure identical to vitamin H and coenzyme R; ubiquitous member of the Vitamin B complex required by or occurring in all forms of life.
BLLB	Bilirubin	A reddish yellow pigment C ₃₃ H ₃₆ N ₄ O ₆ that occurs especially in bile and blood and causes jaundice if accumulated in excess (www.intelihealth.com Merrium-Webster Medical Dictionary)
BPHY	b-phycoerythrin	A protein
<BUNT>	Blood Urea Nitrogen	Nitrogen attached to urea which is a waste product of protein metabolism. Measured to assess kidney function.
C4CD	C4 acids	Initial product of photosynthesis.
C9BT	Total 9b,19-cyclopropylsterols	Sterol - steroids with long aliphatic side chains at position 17 and at least one alcoholic hydroxyl group, usually at position 3 with lipid-like solubility
CACO	Calcium Content	Found in nearly all organized tissues
CAAL	Calcium to aluminum Ratio	The ratio of the amount of calcium to aluminum in an organism or organism's parts.
CAMP	Adenosine 3',5'-cyclic Monophosphate	A key regulator which acts to control the rate of a number of cellular processes in bacteria, most animals, and some higher plants.
CANA	Calcium to sodium ratio	Ratio of calcium to sodium in an organism or organism's tissues.
CAPH	Calcium/Phosphorus Ratio	Calcium and phosphorus form Calcium phosphate, the dense hard material found in teeth and bones

BCM BIOCHEMICAL EFFECT		
CARB	Carbohydrate	An aldehyde or ketone derivative of a polydric alcohols, including starches, sugars, coluloses and burns.
CARC	Carotenoid Content	Isomeric pigments having colors from violet to yellow.
CARO	Carotene	Any of several red, crystalline carotenoid hydrocarbon pigments occurring widely in nature, convertible in the animal body to Vitamin A.
CAZN	Calcium to Zinc Ratio	Ratio of calcium to zinc in an organism or organism's tissues.
CCON	Carbon Content	
CDAI	Cadmium Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
CDCO	Cadmium Content	
CDST	acid soluble thiol	
CDPR	Cadmium to Phosphorus ratio	The ratio of cadmium to phosphorus.
CDZN	Cadmium to Zinc Ratio	The ratio of cadmium to zinc.
CERO	Ceruloplasmin	A blue copper containing dehydrogenase protein (135 kD) found in serum (200-500_g/ml) that is apparently involved in copper detoxification and storage and possibly also in mopping up excess oxygen radicals or superoxide anions. (Gray's)
CGMP	Cyclic guanylic acid, cGMP	3',5' cyclic ester of guanylic acid. A second messenger generated by guanylyl cyclase and is a major component of ribonucleic acids. (Gray's)
CHES	Cholesteryl ester	Esterified cholesterol. (ECOREF#67751)
CHLA	Chlorophyll 'A' Concentration	Pigment found in photosynthetic cells; occurs in all organisms exhibiting aerobic photosynthesis
CHLB	Chlorophyll 'B' Concentration	Pigment found in photosynthetic cells; occurs in all higher plants
CHLC	Chlorophyll C concentration	Any of a group of green magnesium-containing porphyrin derivatives occurring in all photosynthetic organisms. Chlorophylls act as respiratory pigments, converting light energy to reducing potential. Chlorophyll C occurs in diatoms and brown algae.
CHLN	Choline	Considered to be a vitamin of the B complex, found in many animal and plant tissues

BCM BIOCHEMICAL EFFECT		
CHLO	Chlorophyll, General	Pigment found in photosynthetic cells. Measurable change in chlorophyll content including chlorophyll content, chlorosis.
CHLR	Chloride	Salt of hydrochloric acid; any binary comp of chlorine
CHOL	Cholesterol	A pearly, fatlike steroid alcohol, found in animal fats and oils, bile, blood, brain tissues, milk, egg yolk, myelin sheath, liver, kidneys and adrenal gland - precursor to Steroids and sex hormones.
CHYM	Chymotrypsinogen	An inactive proteolytic enzyme of pancreatic juice; converted to the active form, chymotrysin, by trypsin.
CITA	Citric acid	An important intermediate in the citric acid cycle which breaks down glucose into water and carbon dioxide when oxygen is present. (Gray's)
CLCO	Chlorine concentration	
CLLG	Collagen	The protein substance of the white fibers (collagenous fibers) of skin, tendon, bone, cartilage and all other connective tissue, composed of molecules of tropocollagen, it is converted into gelatin by boiling. Collagenous pertaining to collagen, forming or producing collagen. (Gray's)
CLMD	Calmodulin	A calcium binding protein with four EF hand binding sites for calcium.
CMPH	Camphor Concentration	
CMYS	Chymotrypsin	Serine proteases from pancreas. Preferentially hydrolyze Phe, Tyr or Trp peptide and ester bonds. (http://cancerweb.ncl.ac.uk/)
CNRA	Carbon to Nitrogen Ratio	
CO2C	Carbon Dioxide Content	
COAN	Chlorpyrifos-o-analog	A metabolite of the chemical Chlorpyrifos
COCO	Cobalt Content	
CP2K	Cytochrome P2K (CYP 2K)	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; P2K = pigment 2K
CP3K	Cytochrome P3K (CYP 3K)	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; P3K = pigment 3K

BCM BIOCHEMICAL EFFECT		
CPRP	Coproporphyrin	Produced by oxidation of the methylene bridges in coproporphyrinogen - an intermediate in the formation of heme; coproporphyrin III is excreted in the feces in hereditary coproporphyria;
CRBR	Cerebroside	Glycolipid found in brain (11% of dry matter). Sphingosine core with fatty amide or hydroxy fatty amide and a single monosaccharide on the alcohol group (either glucose or galactose). (Gray's)
CRCO	Chromium content	
CREA	Creatinine	Anhydride of creatine; found in muscle and blood and excreted in the urine.
CRLP	Ceruloplasmin	A blue copper containing dehydrogenase protein (135 kD) found in serum (200-500_g/ml) that is apparently involved in copper detoxification and storage and possibly also in mopping up excess oxygen radicals or superoxide anions. (Gray's)
CRMD	Ceramide	An N-acyl sphingosine, the lipid moiety of glycosphingolipids
CRPR	Chromium to Phosphorus Ratio	
CRTN	Creatine	A compound which is made by the body and is used to store energy in the form of phosphate molecules.(http://cancerweb.ncl.ac.uk/)
CUAI	Copper Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
CUCD	Copper to Cadmium ratio	The ratio of copper to cadmium.
CUCR	Copper to Carbon ratio	The ratio of copper to carbon in a sample
CYTN	Cysteine	A crystalline sulfur-containing amino acid $C_3H_7NO_2S$ readily oxidizable to cystine.
CYSI	Cystine	
CUCO	Copper Content	Metal; is essential in nutrition, component of various proteins
CUMN	Copper to Manganese Ratio	
CUMO	Copper to molybdenum ratio	Ratio of copper to molybdenum in an organism or organism's tissues.
CUZN	Copper to Zinc Ratio	

BCM BIOCHEMICAL EFFECT		
<D44T>	Total 4,4 Dimethylsterols	Sterol - steroids with long aliphatic side chains at position 17 and at least one alcoholic hydroxyl group, usually at position 3 with lipid-like solubility
DABT	Dehydroascorbate	A salt or ester of dehydroascorbic acid. (Gray's)
DALA	delta-Aminolevulinic acid	The delta-aminolevulinic acid (pronounce) synthase (ALA synthase) reaction occurs in the mitochondria. The product of the reaction, ALA, diffuses into the cytoplasm, where the next several steps of heme synthesis occur. (http://medlib.med.utah.edu/NetBiochem/hi31.htm)
DASC	Dehydroascorbic acid	L-threo-2,3-hexodiulosonic acid gamma-lactone. The reversibly oxidised form of ascorbic acid. It is the lactone of 2,3-diketogulonic acid and has antiscorbutic activity in man on oral ingestion. (Gray's)
DDRP	Didehydroretinyl palmitate	A vitamin
DGDG	Digalactosyl Diglyceride (Glycolipid)	Glycolipid - lipid containing carbohydrate groups, usually galactose. The simplest are the glycodiacyl-glycerols.
<DI4T>	Total 4-dimethysterols	
DHCA	1,25-Dihydrocholecalciferol (also Calcitriol)	The form of vitamin D3 that is biologically active in intestinal transport and calcium resorption by bone. (cancerweb.ncl.ac.uk)
DHRT	Dehydroretinol (Vitamin A2)	3-Dehydroretinol; retinol with an additional double bond in the 3-4 position of the cyclohexane ring. It is also called vitamin A2 (cancerweb.ncl.ac.uk). Also known as Didehydroretinol.
DISC	Diethylsuccinate Hydrolysis	
DOPC	3,4-Dihydroxyphenylacetic acid	A metabolite of dopamine.
DPHZ	1, 1-Diphenyl-2-picryl hydrazyl	
DPPA	2,3-diphosphoglyceric acid	a by- product of glycolysis can bind with hemoglobin (http://www.hhp.ufl.edu/classes/ess/Spring/Pet3351jd/pdf3351/3351Chapter10.PDF)
DRYM	Dry matter	All soluble and insoluble organic substances and inorganic substances present in a sample except for water. (www.florafood.com/common/documents/alidefpar.pdf)

BCM BIOCHEMICAL EFFECT		
DSMN	Desmosine	Component of elastin, formed from four side chains of lysine and constituting a cross linkage. (Gray's)
DTBL	Direct Bilirubin (Conjugated)	Bilirubin - breakdown product of heme, normally circulates in plasma as a complex with albumin and is taken up by the liver cells and conjugated
ECCR	Echinochrome	A quinone, echinochrome, is the red coloring matter in sea urchins and sand dollars.
ECSP	Eicosapentaenoate	A fatty acid.
ELST	Elastin	Glycoprotein (70 kD) randomly coiled and cross linked to form elastic fibers that are found in connective tissue. Like collagen, the amino acid composition is unusual with 30% of residues being glycine and with a high proline content. Cross linking depends upon formation of desmosine from four lysine side groups. The mechanical properties of elastin are poorer in old animals. (Gray's)
ELYT	Electrolytes	A chemical compound which when molten or dissolved in certain solvents, usually water, will conduct an electrical current.
ENKP	Enkephalins	Natural opiate pentapeptides isolated originally from pig brain. Leu enkephalin YGGFL) and Met enkephalin (YGGFM) bind particularly strongly to μ type opiate receptors. (http://cancerweb.ncl.ac.uk/)
EPNP	O-Ethyl-O-p-nitrophenylbenzenethionophosphate	the amount of O-Ethyl-O-p-nitrophenylbenzenethionophosphate contained within a response site
ERUC	Erucic Acid	A monoethenoid acid that is the cis isomer of brassidic acid and makes up 40 to 50% of the total fatty acid in rapeseed, wallflower seed, and mustard seed.
ESAA	Amino Acids, Essential	Amino acids required for protein synthesis that cannot be synthesized by the organism and therefore must be maintained in the diet.
ETCO	epsilon-Tocopherol concentration	One of eight compounds that occur in nature that have vitamin E activity, an essential vitamin that functions as an antioxidant.
ETSR	Erythrocyte sedimentation rate	A test that measures the rate at which red blood cells settle through a column of liquid. A non-specific index of inflammation. (cancerweb.ncl.ac.uk)
7ERF	7-Ethoxyresorufin	
ETHL	Ethylene	A colorless, flammable gas with a sweet taste and odor.
FAME	Fatty Acid Methyl Ester	

BCM BIOCHEMICAL EFFECT		
FATL	Fatty acid, total	Total amount of fatty acids .Any number of saturated aliphatic monocarboxylic acids. A metabolic byproduct from the breakdown of fats. Chemically R COOH where R is an aliphatic moiety.
FBNT	Fibronectin	A large glycoprotein found on the surface of cells and mediates cellular adhesion, control of cell shape and cell migration.
FBRG	Fibrinogen	Soluble plasma protein (340 kD, 46 nm long), composed of 6 peptide chains. (Gray's)
FEAI	Iron Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
FEMN	Iron to Manganese Ratio	
FENR	Fenretinide (4-Hydroxy-retinoic acid)	A Vitamin-A derivative. A synthetic retinoid. It is an effective as an antineoplastic agent. (http://cancerweb.ncl.ac.uk)
FEZN	Iron to zinc ratio	
FFTA	Fatty Acids, Free or Nonesterified	Straight chained monocarboxylic acid, that are nonesterified; the fraction of plasma fatty acids that are not in the form of glycerol; transported complexed with albumin
FIBR	Fiber	Amount of fiber from a diet
FLRS	Fluorescence	Used for algae or other organisms that naturally fluoresce, may be used to measure chlorophyll or population growth rate. For example, if it is specifically stated that fluorescence is used to measure chlorophyll A, code the measurement as CHLA. Property of emitting light while exposed to light, the emitted light having a wavelength only slightly longer than that of the light absorbed
FRCT	Fructose	A 6 carbon sugar (hexose) abundant in plants. Fructose has its reducing group (carbonyl) at C2 and thus is a ketose, in contrast to glucose that has its carbonyl at C1 and thus an aldose. Sucrose, common table sugar, is the nonreducing disaccharide formed by an alpha linkage from C1 of glucose to C2 of fructose (latter in furanose form). Fructose is a component of polysaccharides such as insulin, levan. (gRAY'S mEDICAL)
FSPP	Female specific proteins	Proteins that only appear in female hemolymph during oocyte maturation (http://biotech.korea.ac.kr/member/kimhr/17.pdf)
GABA	gamma-Aminobutyric acid	Thought to be a central nervous system postsynaptic inhibitory transmitter.
GBCM	Biochemical, General	Biochemistry - the chemistry of living organisms and the vital processes; physiological chemistry.

BCM BIOCHEMICAL EFFECT		
GCBN	Gap charge balance	A measurement used for determining blood gases. Because of electrochemical balance the concentrations of serum cations and anions are the same. However, in the routine measurement of electrolytes, more anions are unmeasured than are cations; this leads to an expected "anion gap." As typically calculated, the anion gap is based on only three electrolytes: sodium, chloride and bicarbonate (or serum CO ₂). (http://www.mtsinai.org/pulmonary/noninvasive/gaps.htm)
GD1A	Ganglioside GD1a	Any disease characterized, in part, by the abnormal accumulation within the nervous system of specific gangliosides, e.g., GM2 gangliosidosis, Tay-Sachs disease, caused by hexosaminidase A enzyme deficiency with accumulation of GM2 ganglioside (Gray's)
GD1B	Ganglioside GD1b	Any disease characterized, in part, by the abnormal accumulation within the nervous system of specific gangliosides, e.g., GM2 gangliosidosis, Tay-Sachs disease, caused by hexosaminidase A enzyme deficiency with accumulation of GM2 ganglioside (Gray's)
GESM	Geosmin	Geosmin, trans-1,10-dimethyl-trans-9-decalol, is a metabolite produced by several cyanobacteria species at varying amounts.
GERA	Geranyl Acetate	
GERN	Geraniol	Used in perfumery and flavoring.
GGGH	Glutathione disulfide to glutathione ratio	The ratio of glutathione disulfide to glutathione
GGLB	gamma-Globulins	A simple globular protein which cannot be dissolved in pure water but which can be dissolved if a salt is added to the water. It can also be precipitated out of solution and into a solid with a solution of ammonium sulphate at 50% saturation (Graylab on-line medical dictionary).
GGM1	Ganglioside GM1	Form of gangliosidosis characterized by accumulation of g(m1) ganglioside and oligosaccharides, and caused by an absence or severe deficiency of beta-galactosidase a. The three phenotypes of g(m1) gangliosidosis are called infantile (generalized), juvenile, and adult (types 1, 2, and 3 respectively), referring to the age at which clinical manifestations appear. (Gray's)
GGT1	Ganglioside GT1	Any disease characterized, in part, by the abnormal accumulation within the nervous system of specific gangliosides, e.g., GM2 gangliosidosis, Tay-Sachs disease, caused by hexosaminidase A enzyme deficiency with accumulation of GM2 ganglioside (Gray's)
GINS	Ginsenosides	
GLCN	Glycine	An amino acid

BCM BIOCHEMICAL EFFECT		
GLOB	Globulin	A simple globular protein which cannot be dissolved in pure water but which can be dissolved if a salt is added to the water. (www.graylab.ac.uk)
GLTH	Glutathione	A widely distributed tripeptide that is important in plant and animal tissue oxidation reactions.
GLTL	Galactolipid	a glycolipid that yields galactose on hydrolysis (http://www.fasthealth.com/dictionary/g/galactolipid.php)
GLTT	Glutamate	A salt or ester of glutamic acid.
GLUC	Glucose	A sugar
GLYC	Glycogen	A polysaccharide stored in the liver and muscles
GLYP	Glycoprotein Composition	Glycoprotein - Any of a class of conjugated proteins containing both carbohydrate and protein units.
GLYT	Total Glycolipid Content	Glycolipid - a lipid containing carbohydrate groups
GMIN	Glutamine	Monoamide of glutamic acid, important carrier of urinary ammonia and is broken down in the kidney by the enzyme glutaminase
GNGL	Ganglioside	A glycosphingolipid that contains one or more residues of N acetyl or other neuraminic acid derivatives. Gangliosides are found in highest concentration in cells of the nervous system, where they can constitute as much as 5% of the lipid. (Gray's)
GPRO	Glial fibrillary acidic protein	A protein found in microfilaments of glial cells, helps distinguish glial from non-glial tumors. (Grayline)
GSSG	Glutathione disulfide	A glutathione derivative that forms when the sulfhydryl side chains of the cysteine residues of two glutathione molecules form a disulfide bond during the course of being oxidised with various oxides and peroxides in cells. (Gray's)
GTAS	Glutamine and asparagine	Glutamine: An amino acid. Monoamide of glutamic acid, important carrier of urinary ammonia and is broken down in the kidney by the enzyme glutaminase. Asparagine: A white crystalline amino acid found in many plant seeds (McGraw-Hill, Scientific Dictionary)
GTCO	gamma-Tocopherol concentration	One of eight compounds that occur in nature that have vitamin E activity, an essential vitamin that functions as an antioxidant.
GTMA	Glutamic acid	An amino acids commonly found in proteins. Plays a central role in amino acid metabolism, acting as precursor of glutamine, proline and arginine.

BCM BIOCHEMICAL EFFECT		
GYCL	Glycerol content	A sweet syrupy hygroscopic trihydroxy alcohol C ₃ H ₈ O ₃ usually obtained by the saponification of fats and used especially as a solvent and plasticizer .
H108	Heat shock protein 108	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
H2O2	Hydrogen Peroxide	Unstable colorless liquid used as a bleach, chemical intermediate, rocket fuel, and antiseptic.
HCO3	Bicarbonate (HCO ₃ -) concentration	<p>A carbonate in which but half the hydrogen of the acid is replaced by a positive element or radical, thus making the proportion of the acid to the positive or basic portion twice what it is in the normal carbonates; an acid carbonate; sometimes called supercarbonate.</p> <p>They are an important factor in determining the pH of the blood and the concentration of bicarbonate ions is regulated by the kidney. Levels in the blood are an index of the alkali reserve or buffering capacity. (Gray's)</p>
HDCB	Hydrocarbons	An organic molecule which consists only of carbon and hydrogen atoms, and no other elements (http://cancerweb.ncl.ac.uk)
HDCH	High density lipoprotein cholesterol:Total cholesterol	The ratio between high density lipoprotein cholesterol and total cholesterol concentrations in a sample
HDLC	High density lipoprotein cholesterol	Lipoproteins, which are combinations of lipids (fats) and proteins, are the form in which lipids are transported in the blood
HEME	Heme Content	Heme - any quadridentate chelate of iron with the four pyrrole groups of a porphyrin; found in blood
<HEMT>	Hematological Parameters	
HGCO	Mercury concentration	The concentration of mercury found in a sample
HIST	Histidine	An amino acid
HITY	Histidine to tyrosine ratio	Ratio of histidine to tyrosine in an organism or organism's tissues
HMCT	Hematocrit (Anemia)	Measurement of the volume of packed red cells in a blood specimen after centrifugation of hematocrit tube

BCM BIOCHEMICAL EFFECT		
HMCY	Hemocyanin	A blue respiratory pigment found only in mollusks and in arthropods other than insects.
HMGL	Hemoglobin	Oxygen carrying pigment of the erythrocytes
HMGIT	Hemagglutinin	An erythrocyte-agglutinating antibody.
HMPG	4-Hydroxy-3-methoxyphenylglycol	A metabolite of norepinephrine (abbreviated by MHPG)
HNMS	N[3H-methyl]scopolamine	
HP20	Heat shock protein 20	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP30	Heat shock protein 30	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP32	Heat shock protein 32	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP40	Heat shock protein 40	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP42	Heat shock protein 42	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP52	Heat shock protein 52	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP60	Heat Shock Protein 60 (HSP60)	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP70	Heat Shock Protein 70 (HSP70)	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP72	Heat shock protein 72	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.

BCM BIOCHEMICAL EFFECT		
P73	Heat shock protein 73	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP75	Heat shock protein 75	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP90	Heat shock protein 90	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HP96	Heat shock protein 96	Any of a group of a proteins that are synthesized in the cytoplasm of cells as part of the heat shock response and act to protect the chromosomes from damage.
HPLN	Hydroxyproline	Specific proline residues on the amino side of a glycine residue in collagen become hydroxylated at C4, before the polypeptides become helical, by the activity of prolyl hydroxylase. This enzyme has a ferrous ion at the active site and a reducing agent such as ascorbate is necessary to maintain the iron in the ferrous state. The presence of hydroxyproline is essential to produce stable triple helical tropocollagen, hence the problems caused by ascorbate deficiency in scurvy. This unusual amino acid is also present in considerable amounts in the major glycoprotein of primary plant cell walls (see HRGP). (Gray's)
HSTM	Histamine	Formed by decarboxylation of histidine. Potent pharmacological agent acting through receptors in smooth muscle and in secretory systems. Stored in mast cells and released by antigen. (See hypersensitivity). Responsible for the early symptoms of anaphylaxis. Also present in some venoms. (Gray's)
HVLA	Homovanillic acid	A metabolite of dopamine
HXDC	Hexadecenoate	A fatty acid.
IBIL	Indirect Bilirubin (Free)	Bilirubin - breakdown product of heme, normally circulates in plasma as a complex with albumin and is taken up by the liver cells and conjugated
ICON	Iodine concentration	The concentration of Iodine found in a sample
IDMN	Isodesmosine + Desmonine	Isodesmosine: 2-(4-amino-4-carboxybutyl)-1-(5-amino-5-carboxypentyl)-3,5-bis(3-amino-3-carboxypropyl)pyridinium. A rare amino acid found in elastin, formed by condensation of four molecules of lysine into a pyridinium ring. PLUS Desmosine: Component of elastin, formed from four side chains of lysine and constituting a cross linkage. (Gray's)
ILEU	Isoleucine	An amino acid

BCM BIOCHEMICAL EFFECT		
IMNT	Iso-menthone	
ISDM	Isodesmosine	2-(4-amino-4-carboxybutyl)-1-(5-amino-5-carboxypentyl)-3,5-bis(3-amino-3-carboxypropyl)pyridinium. A rare amino acid found in elastin, formed by condensation of four molecules of lysine into a pyridinium ring. (Gray's)
FECO	Iron Content	Metal that is an essential constituent of hemoglobin, cytochrome and other components of respiratory enzyme systems; chief function is the transport of oxygen to tissues and in cellular oxidation mechanisms
KCDR	Potassium Cadmium Ratio	The ratio of potassium to cadmium in a sample
KCUR	Potassium Copper Ratio	The ratio of potassium to copper in a sample
KNAR	Potassium Sodium Ratio	The ratio of potassium to sodium in a sample
LA2S	L-Ascorbyl-2-sulfate	
LACT	Lactate	The anionic form of lactic acid, a salt of lactic acid
LAMT	Total lauric acid metabolites	A total of all metabolism products of lauric acid. (ECOREF#67744)
LASC	L-ascorbic acid	Synonym-ascorbic acid (ASCA). Vitamin C. A water-soluble vitamin found in many fruits and vegetables. (Dorlands)
LASS	L-ascorbyl-2-sulfate	A stable derivative of ascorbic acid used as a source of vitamin C. http://www.asasea.com/technical/AQ48-okeefe.pdf
LCCT	Leucocrit	(leukocrit) the volume percentage of leukocytes in whole blood
LCTA	Lactic Acid	Metabolic intermediate involved in biochemical processes, end product of glycolysis
LCTS	Lactose	The major sugar in human and bovine milk. (cancerweb.ncl.ac.uk)
LDLP	Low density lipoprotein	lipoprotein substances (combination of a fat and a protein) which acts as a carrier for cholesterol and fats in the bloodstream. (Gray's)
LDNT	Lipids, Neutral	
LDPL	Lipids, Polar	

BCM BIOCHEMICAL EFFECT		
LDPO	Lipid Peroxides	Peroxides produced in the presence of a free radical by the oxidation of unsaturated fatty acids in the cell in the presence of molecular oxygen. The formation of lipid peroxides results in the destruction of the original lipid leading to the loss of integrity of the membranes. They therefore cause a variety of toxic effects in vivo and their formation is considered a pathological process in biological systems. Their formation can be inhibited by antioxidants, such as vitamin e, structural separation or low oxygen tension.
LNLN	Linolenic acid	An 18 carbon fatty acid with three double bonds (9, 12, 15, octadecatrienoic acid) and isomers. Essential dietary component for mammals. (cancerweb.ncl.ac.uk)
LPPX	Lipoperoxide	A chemical that impairs prostacyclin synthesis and promote thromboxane synthesis, which can increase platelet aggregation.
PBAI	Lead Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
PBCO	Lead Content	Metal
LEUC	Leucine	An amino acid
LGHE	Leghemoglobin	Leghemoglobin is a red-colored enzyme active in the environment of N ₂ -fixing nodules; leghemoglobin mediates the high O ₂ requirements of the N ₂ -fixing bacteroids and the necessity of the O ₂ -limited environment.
LICO	Lithium content	
LIMO	Limonene	A terpene with a lemon odor that is found in oils from citrus fruits and in oils from peppermint and spearmint.
LINA	Linalool	A terpene that has a bergamot odor and is found in many essential oils, particularly in bergamot and rosewood; used as a flavoring agent and in perfumes.
LINO	Linoleic Acid	A principal fatty acid in plants and considered essential in animal nutrition; used in medicine, feeds, paints, and margarine.
LIPD	Lipid	Fat or fat-like substances, total lipid
<LIPT> goes to LIPD	Lipid Content, Total	
LNEI	Linolenic and Eicosenoic Acid	Linolenic acid - One of the principle unsaturated fatty acids in plants and essential fatty acids in plants and an essential fatty acid in animal nutrition. Eicosenoic acid - a saturated fatty acid; a constituent of butter.

BCM BIOCHEMICAL EFFECT		
LNLT	Linoleate	A fatty acid. A salt of linoleic acid.
LPFS	Lipofuscin	Any of a group of liquid pigments found in cardiac and smooth muscle cell, in macrophages, and in parenchyma and interstitial cells; differential reactions include sudanophilia, Nile blue staining, fatty acid , glycol, and ethylene
LPSA	Lipid Soluble Antioxidants	Antioxidant - substance that prevents or delays deterioration by action of oxygen
LYSI	Lysine	An amino acid
LUTE	Lutein	An orange xanthophyll C ₄₀ H ₅₆ O ₂ occurring in plants, animal fat, egg yolk, and the corpus luteum.
MCHC	Mean Corpuscular Hemoglobin Concentration	The mean concentration of hemoglobin in the red blood cell (hemoglobin/hematocrit).
MCHG	Mean Corpuscular Hemoglobin	The mean mass of hemoglobin in the red blood cell (hemoglobin * 10/red blood cell count).
MCON	Mineral content	Mineral content
MCPR	Microsomal Proteins	Proteins found in microsomes
MCPV	Mean Corpuscular Volume	Measure average size of a single red blood cell. Used to classify anemias. Derived value obtained by dividing hematocrit / Total RBC
MCYS	Microcystin	.M. aeruginosa produces compounds called microcystins, which are potent hepatotoxins and probable tumor promoters.
METH	Methionine	An amino acid
7MRF	7-Methoxyresorufin	
MGAL	Magnesium to aluminum ratio	The ratio of the amount of magnesium to aluminum in an organism or organism's parts.
MGCO	Magnesium	Metal, that is essential in nutrition, required for the activity of many enzymes, especially those concerned with oxidative phosphorylation

BCM BIOCHEMICAL EFFECT		
MGDG	Monogalactosyl Diglyceride (Glycolipid) Content	Glycolipid - lipid containing carbohydrate groups, usually galactose. The simplest are the glycodiacyl-glycerols.
MGLB	Methemoglobin	Hemoglobin in the oxidized state. Also methaemoglobin.
MLAT	Malate	A salt of malic acid.
MLDH	Malondialdehyde	Malonaldehyde is found in many foodstuffs and can be present at high levels in rancid foods. It is present as a lipid metabolite in human and animal tissues. It is probably used only as a research chemical.
MNAI	Manganese Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
MNAC	Menthyl Acetate	
MNCO	Manganese Content	Metal, occur in body tissue in very small amounts and acts as an activator of liver arginase and other enzymes
MNFE	Manganese to iron ratio	Ratio of manganese to iron in an organism or organism's tissues
MNTH	Menthone	Oily, colorless ketonic liquid with slight peppermint odor.
MOCO	Molybdenum Content	A silvery metal used in iron-base alloys.
MRNN	Marennine	A blue pigment secreted by algae.
MRXC	Mirex concentration	The amount of the chemical Mirex found in an organism, tissue or response site
MTHL	Menthol	A compound used in medicines and perfumes, and as flavoring agent. Also known as peppermint camphor.
MTLN	Metallothionein	A group of vertebrate and invertebrate proteins that bind heavy metals that may be involved in zinc homeostasis and resistance to heavy-metal toxicity.
MUCR	Muscarinic Cholinergic Receptor	
MYLN	Myelin	The material making up the myelin sheath of nerve axons. (http://cancerweb.ncl.ac.uk/)

BCM BIOCHEMICAL EFFECT		
NADG	beta-N-Acetyl-D-glucosaminidase	A lysosomal enzyme known to be released from macrophages during inflammation.
<NADP>	Nicotinamide-adenine Dinucleotide Phosphate, Reduced	(nicotinamide) NADP - a coenzyme compound of nicotinamide 5'-phosphate, serves as an electron carrier in a number of reactions
NAKR	Sodium:Potassium Ratio	The ratio of sodium to potassium in a sample.
NAZN	Sodium Zinc Ratio	The ratio of sodium to zinc in a sample
NO3-	Nitrate	
NCON	Nitrogen	Gaseous element that is a constituent of protein and nucleic acids and is present in all living cells
NEAA	Amino Acids, Nonessential	The amino acids required for protein synthesis that are synthesized by the organism and are not specifically required in the diet
NICO	Nickel Content	
NIFE	Nickel to nitrogen ratio	Ratio of nickel to nitrogen in an organism or organism's tissues.
NKPH	Enkephalin	either of two peptides with opiate and analgesic activity that occur naturally in the brain and have a marked affinity for opiate receptors (M.W. On-line)
NOCO	Nitric Oxide concentration	This compound is produced from L arginine by the enzyme nitric oxide synthase. Acts as a potent vasorelaxant via elevation of intracellular cGMP in vascular smooth muscle. (cancerweb.ncl.ac.uk)
NPSH	Nonprotein Sulfhydryl	Sulfhydryl - the univalent radical of sulfur
NPSS	Ninhydrin-positive Substances	
NRGC	Energy Compound	

BCM BIOCHEMICAL EFFECT		
NRMA	Neuraminic acid	Sometimes known as sialic acid, but strictly one of a family of sialic acids (which includes also N glycolyl neuraminic acid and O substituted derivatives). It is a 9 carbon sugar formed by adding to mannose three carbons from pyruvate. Occurs in the subset of glycolipids known as gangliosides and in glycoproteins. The presence of its carboxyl group on glycolipids and glycoproteins is responsible for much of the negative charge on animal cell surfaces. (Gray's)
NSRA	Nitrogen to sulfur ratio	
NSUG	Non-reducing sugars	Sugar and therefore does not react with amino acids or proteins.
NUAC	Nucleic Acids	A large, acidic, chainlike molecule containing phosphoric acid, sugar, and purine and pyrimidine bases; two types are ribonucleic acid and deoxyribonucleic acid.
NUTR	Nutrient Status Change	
NXNT	Neoxanthine	Carotenoid pigments involved in photosynthesis. Consist of oxygenated carotenes, eg. lutein, violaxanthin and neoxanthine.
O1LA	(omega -1)-Hydroxy lauric acid	Hydroxylation product of the metabolism of lauric acid. (ECOREF#67744)
O2LA	(omega-2)-Hydroxy lauric acid	Hydroxylation product of the metabolism of lauric acid. (ECOREF 67744)
O3LA	(omega-3)-Hydroxy lauric acid	Hydroxylation product of the metabolism of lauric acid. (ECOREF#67744)
O6LA	(omega-6)-Hydroxy lauric acid	Hydroxylation product of the metabolism of lauric acid. (ECOREF#67744)
OACD	Organic acids	Initial product of photosynthesis.
OGLT	Oxidized glutathione	Predominant non-protein thiol in animal tissues and in many physiological fluids
OHGL	O2 Specific Bond to Hemoglobin	
OLCO	Oil Content	

BCM BIOCHEMICAL EFFECT		
OLEC	Oleic Acid	Yellowish, unsaturated fatty acid with lardlike aroma; the main component of olive and cooking oils; used in soaps, ointments, cosmetics, and ore beneficiation.
OLYD	Oil Yield	
ONRA	Oxygen to nitrogen ratio	The ratio of oxygen to nitrogen in a sample
ORNI	Ornithine	An amino acid
OCON	Oxygen Content	
OSDB	Oestradiol breakdown products	Amount of polar metabolites formed in nmoles/ g microsomal fraction from the breakdown of estradiol.
OXHC	Oxyhemocyanin	Hemocyanine charged with oxygen
PARG	Phosphoarginine	A high-energy phosphate compound that is primarily found in invertebrates.
PALL	Palmitoleic Acid	An unsaturated fatty acid, found in marine animal oils.
PALM	Palmitic Acid	A fatty acid derived from spermaceti; used to make metal palmitates and in soaps, water-proofing , and lubricating oils.
7PRF	7-Pentoxoresorufin	
PBHB	Poly-b-hydroxybutyrate	
PBIC	Lead 131-Iodine content	The content of Lead 131-iodine found in an organism or tissue
PCBC	PCB concentration	The amount of the chemical(s) Polychlorinated biphenol(s) found in an organism, tissue or response site
PCLV	Packed Cell Volume	The venous hematocrit determined by centrifucation; the number of packed red cells in ml/100ml of centrifuged blood
PCRE	Phosphocreatinine	A high energy reservoir for ATP formation (http://web.stcloudstate.edu/lsreerama/Assets/Biochem480/MetabGen.pdf)
PDST	Phosphodiester	
PEGE	Polyethylene Glycol (Peg) Efflux	

BCM BIOCHEMICAL EFFECT		
PFER	Phosphorus to Iron Ratio	
PGE2	Prostaglandin E2	Any of a group of components derived from unsaturated 20 carbon fatty acids, primarily arachidonic acid, via the cyclooxygenase pathway that are extremely potent mediators of a diverse group of physiologic processes. The abbreviation for prostaglandin is PG, specific compounds are designated by adding one of the letters A through I to indicate the type of substituents found on the hydrocarbon skeleton and a subscript (1, 2 or 3) to indicate the number of double bonds in the hydrocarbon skeleton for example, PGE2. All of the prostaglandins act by binding to specific cell surface receptors causing an increase in the level of the intracellular second messenger cyclic AMP (and in some cases cyclic GMP also). The effect produced by the cyclic AMP increase depends on the specific cell type. Increased cyclic AMP increases prostaglandin synthesis leading to further increases in cyclic AMP. See also individual prostaglandins. (cancerweb.ncl.ac.uk)
PHEN	Phenylalanine	An amino acid
PCON	Phosphorus Content	Essential element in the diet, found in bones, abundant in all tissues, is involved in some form in almost all metabolic processes
PHPH	pH	Hydrogen ion concentration
PHSC	Phosphatidyl Choline (Phospholipid) Content	Choline attached to a phospholipid; major component of cell membranes
PHSE	Phosphatidyl Ethanolamine (Phospholipid) Content	A phospholipid with an ethanolamine attached; major constituent of cell membranes
PHSG	Phosphatidyl Glycerol (Phospholipid) Content	
PHSI	Phosphatidyl Inositol (Phospholipid)	A phospholipid with the sugar inositol attached; minor constituent of cell membranes
PHSP	Phosphatide Phosphorus	Phospholipid with phosphorus
PHST	Phospholipid Content, Total	Phospholipid - major form of lipid in cell membranes

BCM BIOCHEMICAL EFFECT		
3PPG	3-phosphoglycerate	One of the molecules involved in the Calvin cycle which is the fixation of carbon dioxide during photosynthesis
PHTC	Phytochelatin	Phytochelatin are small polypeptide compounds produced in plants by enzymes which are expressed in response to heavy-metals (Cd ²⁺ , Pb ⁴⁺) .
PHYC	Phycocyanin	A blue phycobilin. Phycobilin - any of various protein-bound pigments which are open chain tetrapyrroles and occur in some groups of algae.
PINE	Alpha-pinene	Isomeric unsaturated bicyclic terpene hydrocarbon liquids derived from sulfate wood turpentine; used as solvents for coatings and wax formulations, as chemical intermediates for resins, and as lube-oil additives.
PLAC	Pulp:Acid	Pulp to acid ratio
PLAT	Platelets	a minute flattened body, especially blood platelets
PMST	Phosphomonoester	
PNAS	p-Nitroanisol	the amount of p-Nitroanisol contained within a response site
POLD	Peroxidizable lipids	Lipids that are able to be peroxidized.
PORP	Porphyrin	Found in prosthetic groups of hemoglobin, myoglobin, and cytochromes
KCON	Potassium Content	Metallic element of the alkali group, chief cation of muscle and most other cells (intracellular fluid)
PPHT	Phosphate	Phosphate esters occur in many body constituents including nucleotides and nucleic acids, phospholipids, and phosphoproteins
PRCO	Protein Content	Protein - principle component of protoplasm of cells; a combination of amino acids in peptide linkages.
PRLN	Proline	A heterocyclic amino acid occurring in essentially all proteins, and as a major constituent in collagen protein.
PROB	Protein binding	
PRSH	Protein bound sulfhydryl	Protein bound sulfhydryl
PRSL	Soluble Protein	Protein - principle component of protoplasm of cells; a combination of amino acids in peptide linkages.
PRTL	Protein, Total	

BCM BIOCHEMICAL EFFECT		
PRTO	Protoporphyrin	Combines with heme to form the heme prosthetic group of hemoglobin and myoglobin
PRUP	Protein to urea ratio	ratio of protein to urine
PSCY	Plastocyanin	A prototypical blue-copper 'cupredoxin' protein, whose function is electron transfer in photosynthesis.
PSPH	Phosphagen	A nutrient formed from 3 specific amino acids that saturate muscle tissue with creatine which is a compound of muscle energy production
PSPI	Phosphatidylserine and phosphatidylinositol	Derivatives of phosphatidic acids that are parts of biomembranes
PSPY	Phosphoenolpyruvate	An important metabolic intermediate. The enol (less stable) form of pyruvic acid is trapped as its phosphate ester, giving the molecule a high phosphate transfer potential. Formed from 2 phosphoglycerate by the action of enolase.
PYRT	Pyrethrin	A relatively safe botanical poison derived from a species of chrysanthemum, it breaks down quickly in the environment. It kills by interfering with the pattern of insect nerve transmissions.
PYRV	Pyruvate	The end product of glycolysis (used synonymously with pyruvic acid)
PZNR	Phosphorus to Zinc ratio	Ratio of phosphorus to zinc in an organism or organism's tissues.
RBGD	Retinoyl beta-glucuronide	An unstable metabolite of the vitamin A metabolite retinoic acid. (http://www.pharmacy.ohio-state.edu/homepage/program/medchem/medc_curley.html)
RBVL	Relative Blood Volume (Volume/100g Body Weight)	Sum of red cell volume and plasma volume in relation to body weight
<RGSH>	Reduced Glutathione	Reduced form (less hydrogen) of glutathione
RHDP	Rhodopsin	Light sensitive pigment formed from retinal linked through a Schiff's base to opsin: rhodopsin is an integral membrane protein found in the discs of retinal rods and cones, comprising some 40% of the membrane. Vertebrate opsins are proteins of 38 kD. (Gray's)
RIBO	Riboflavin Content	The heat stable factor of the vitamin B complex; serves as a component of two coenzymes - FAD and FMN

BCM BIOCHEMICAL EFFECT		
RIDX	Refractive Index	The refractive power of a medium with that of air which is assumed to be 1
RSUG	Reducing sugars	Reducing sugars refer to any saccharide bearing an anomeric carbon atom which has not formed a glycosidic bond. So called because of the facility with which the aldehyde group reduces mild oxidising agents.
SCCN	Succinate	A salt or ester of succinic acid; for example sodium succinate, the reaction product of succinic acid and sodium hydroxide.
SCON	Sulfur Content	
SECO	Selenium content	
SERI	Serine	An amino acid
SESR	Selenium to sulfur ratio	
SEWE	Steryl esters and wax esters	A component of the lipid content of organisms
SFTD	Sulfatides	Cerebroside sulfuric esters containing one or more sulfate groups in the sugar portion of the molecule (Gray's)
SGMP	Sugar monophosphates	Initial product of photosynthesis.
SGRV	Specific gravity	the ratio of the density of a substance to the density of some substance (as pure water) taken as a standard when both densities are obtained by weighing in air
SIAL	Sialic acid	A group of naturally occurring n- and o-acyl derivatives of the deoxyamino sugar neuraminic acid. They are ubiquitously distributed in many tissues. (Gray's)
SICO	Silicon content	The concentration of silicon found in a sample
SLAC	Silicic acid	
SLFH	Sulfhydryl	The univalent radical of sulfur, also known as thiol
SLFT	Sulfate concentration	The concentration of sulfate measured in a sample.
SPHG	Sphingomyelin	A group of phospholipids, found in brain, spinal cord, kidney, and egg yolk, containing 1-phosphocholine (choline O-phosphate) combined with a ceramide (a long-chain fatty acid linked to the nitrogen of a long-chain base, such as sphingosine). Synonym: ceramide 1-phosphorylcholine, phosphosphingosides. (Gray's)

BCM BIOCHEMICAL EFFECT		
SPHS	Sugar phosphates	Initial product of photosynthesis.
SPIG	Spiggin	A glue protein produced by the kidney of a male stickleback that is used as a cementing substance for the building of a nest (ECOREF#62582)
SPMD	Spermidine	A polyamine compound, C ₇ H ₁₉ N ₃ , found in ribosomes and living tissues and having various metabolic functions. It was originally isolated from semen. (The American Heritage® Dictionary of the English Language: Fourth Edition. 2000.)
SQVD	Sulfoquinovosyl diglyceride	A lipid
SSER	Sulfur to Selenium Ratio	
<SMET>	Secondary Metabolism	
NACO	Sodium Content	Alkaline metallic element, chief cation of the extracellular body fluids
SRCO	Strontium Content	
SSUG	Soluble Sugars	
STER	Stearic Acid	Nature's most common fatty acid, derived from natural animal and vegetable fats.
STES	Sterol esters	Sterol esters are present in plant tissues, but as relatively minor components other than in waxes. Usually the sterol components of sterol esters are similar to the free sterols, although there may be relatively less of stigmasterol (http://www.lipid.co.uk/infores/Lipids/sterols/)
STLD	Saturated lipid or fat	A fatty acid with all potential hydrogen binding sites filled (totally hydrogenated fat) (Gray's)
STOL	Sterols	Any of a group of natural steroid alcohols derived from plants or animals; they are waxy insoluble substances. (www.dictionary.com) Any steroid-based alcohol having a hydrocarbon (aliphatic) side-chain of 8-10 carbons at the 17-beta position and a hydroxyl group at the 3-beta position (therefore an alcohol). (cancerweb.ncl.ac.uk)
STRH	Starch Content	Polysaccharide
SUGA	Sugar Content	A sweet carbohydrate

BCM BIOCHEMICAL EFFECT		
TAUR	Taurine	Is one of the most abundant amino acids in the body. It is found in the central nervous system, skeletal muscle and is very concentrated in the brain and heart. It is synthesized from the amino acids methionine and cysteine, in conjunction with vitamin B6 (http://cancerweb.ncl.ac.uk)
TBAR	Thiobarbituric Acid Reactive Substances	
TCTP	translationally controlled tumor protein	
TEAM	Tetraethyl Ammonium	The bromide and chloride salts are short acting quaternary ammonium ganlion-blocking agents;
TERP	T-terpinene	
TFAA	Amino Acids, Total Free	
THBA	Thiobarbituric Acid	A condensation of malonic acids and ureas; parent compound for a class of barbiturates
THIA	Thiamin	A member of the water-soluble B vitamin group, necessary for energy production and carbohydrate metabolism. Deficiency is known as beriberi. Vitamin B1. (cancerweb.ncl.ac.uk)
THRE	Threonine	An amino acid
TICO	Titanium content	The concentration of titanium found in a sample.
TLCO	Thallium content	The concentration of thallium found in a sample.
TLBL	Bilirubin, Total	Bilirubin - breakdown product of heme, normally circulates in plasma as a complex with albumin and is taken up by the liver cells and conjugated
TMAO	Trimethylamine oxide	Trimethylamine oxide (TMAO) is a common and compatible osmolyte in tissue that is often credited with counteracting protein-destabilizing forces. (www.cephbase.dal.ca/refdb/pdf/6856.pdf)
TNSC	Total Non-structural Carbohydrate	
TPPH	Thiamin pyrophosphate	The diphosphoric ester of thiamin, a coenzyme of several (de)carboxylases, transketolases, and alpha-oxoacid dehydrogenases. Synonym: aneurine pyrophosphate, cocarboxylase, diphosphothiamin. (cancerweb.ncl.ac.uk)

BCM BIOCHEMICAL EFFECT		
TPSY	Trypsin	A proteolytic enzyme which catalyzes the hydrolysis of peptide linkages in proteins.
TRIB	Tributyrin	A colorless fat, found in cows milk
TRIG	Triglycerides (Triacylglycerols)	A neutral fat synthesized from carbohydrates for storage in animal adipose cells; on enzyme hydrolysis it releases free fatty acids in the blood
TRTY	Tryptophan to tyrosine ratio	The ratio of tryptophan to tyrosine in an organism or organism's tissues.
TRYP	Tryptophan	Amino acid
TRYS	Trypsinogen	The zymogen of trypsin, secreted in the pancreatic juice. Also known as protrypsin.
TSFN	Transferrin	A protein that carries iron in the bloodstream (80 kD) found in mammalian serum, a beta globulin. (Gray's)
TAA	Amino Acids, Total	Measure of total amino acids - any organic comp containing an amino and a carboxyl group
TTRN	Transthyretin	an a-globulin secreted by the liver; it forms a complex with retinol binding protein and binds retinol, transporting it to the peripheral tissues. It may also bind triiodothyronine or thyroxine although these are usually transported by thyroxine-binding globulins. (Dorland's)
TYMD	Thymidine	A nucleoside derived from DNA; essential growth factor for certain microorganisms in mediums lacking vitamin B12 and folic acid.
TYRO	Tyrosine	An amino acid
UDPA	Uridine Diphosphate (UDP) Acetylglucosamine	
UPRP	Uroporphyrin	Porphyrins are pigments found in both animal and plant life. This test is useful in evaluating any number of porphyrin disorders (involving the various porphyrins) of red blood cells.
UREA	Urea	Formed in the liver via the urea cycle from ammonia produced by the deamination of amino acids
UREN	Urea nitrogen	The nitrogen associated with the urea in the body
URIC	Uric Acid	The end product of purine catabolism in primates.

BCM BIOCHEMICAL EFFECT		
VACC	Vaccenic acid	n-Trans-11-octadecenoic acid; an unsaturated fatty acid of which both cis- and trans- isomers are found in butter and other animal fats (cancerweb.ncl.ac.uk)
VALI	Valine	An amino acid
VCON	Vanadium content	
VEPO	Vitellogenin:protein ratio	The ratio of the amount of vitellogenin to the amount of protein in an organism
VIDD	Retinyl palmitate:Dehydroretinyl palmitate	Ratio of Retinyl palmitate to Dehydroretinyl palmitate found in a sample
VITA	Retinol (Vitamin A)	Vitamin A1 alcohol; 2,6,6-trimethyl-1-(9'-hydroxy-3',7'-dimethylnona-1',3',5',7'-tetraenyl)cyclohex-1-ene;a half-carotene bearing the b (or beta-ionone) form of the cyclic end group and a CH ₂ OH at the C-15 position (numbering as in carotenoids) or 9'-position (numbering as a nonyl side chain on a cyclohexene ring); an intermediate in the vision cycle, it also plays a role in growth and differentiation. (cancerweb.ncl.ac.uk), Also known as Retinyl palmitate.
VITE	Vitellogenin	The serum phospholipoglycoprotein precursor to egg yolk
VIVT	Vitellogenin:Vitellin ratio	The amount of Vitellogenin to the amount of Vitellin in a sample
VLDL	Very low density lipoprotein	Composed mostly of cholesterol, with little protein and used to transport cholesterol, triglycerides and other lipids to various tissues. Often called "bad cholesterol" because it deposits cholesterol on the walls of arteries. (NIH-medline)
VLXN	Violaxanthine	Carotenoid pigments involved in photosynthesis. Consist of oxygenated carotenes, eg. lutein, violaxanthin and neoxanthine.
VMAC	Vanillylmandelic acid	A metabolite of norepinephrine.
VPRO	Vimentin	An intermediate filament protein found in mesodermally derived cells including muscle. (Grayline)
VTAE	Vitamin A ester (Retinyl ester)	A compound that has a fatty acid bound to the alcohol group of retinol (http://www.canr.uconn.edu/nusci/hpg/fatsolublenotes.pdf)
VTD3	Vitamin D3	Also called cholecalciferol; fat soluble vitamin

BCM BIOCHEMICAL EFFECT		
VTME	Vitamin E	Any of a series of eight related compounds called tocopherols, alpha-tocopherol having the highest biological activity; occurs in wheat germ and other naturally occurring oils.
WTCO	Water Content	The amount of water found in a sample.
<YLKE>	Yolk Energy	
ZNAI	Zinc Accumulation index	The ratio of a chemical in the organism to the ratio of the chemical in the soil.
ZNCD	Zinc to cadmium ratio	Ratio of zinc to cadmium in an organism or organism's tissues.
ZNCO	Zinc Content	Necessary in trace amounts in the body; it forms an essential part of enzymes and plays an important role in protein synthesis and cell division
ZNFE	Zinc to iron ratio	Ratio of zinc to iron in an organism or organism's tissues
ZNNA	Zinc to sodium ratio	Ratio of zinc to sodium in an organism or organism's tissues.
ZNPP	Zinc protoporphyrin	A tightly bound, specific non-polypeptide unit required for the biological function of some proteins. A prosthetic group consisting of a protoporphyrin ring and a central iron (Zn) atom. High levels of zinc protoporphyrin (ZPP) in blood indicate lead exposure (http://www.clunet.edu/BioDev/omm/catalase/frames/hemetx.htm)
ZPP2	Zona pellucide protein 2	A glycoprotein that helps form a non-cellular membrane around a developing egg (ECOREF#67746)
ZPRO	Zona Radiata Protein	Also known as: vitelline envelope, zona radiata, or eggshell protein. A protein involved in the thickening of the cell membrane of the ovum. (partial definition: cancerweb.ncl.ac.uk)
ENZ ENZYME EFFECT		
Measurement Code	Measurement Name	Measurement Definition
2OHB	2-OH Biphenyl Hydroxylase	
3HAO	3-Hydroxyanthranilate oxygenase	An enzyme

ENZ ENZYME EFFECT		
450R	NADPH-cytochrome P-450 Reductase	
4OHB	4-OH Biphenyl Hydroxylase	
5NLT	5-Nucleotidase activity	A liver enzyme that can be measured in the bloodstream. It can be a specific indicator for liver disease when it is elevated
AAPT	Alanine aminopeptidase	Catalysis of the release of an N-terminal amino acid, preferentially alanine, from an oligopeptide or polypeptide. (http://www.informatics.jax.org/searches/GO.cgi?id=GO:0016284)
AATT	Alanine Aminotransferase	Abbreviated as ALT.
ACHE	Acetylcholinesterase	
ACPH	Acid Phosphatase	
AEPX	Aldrin Epoxidase	
AFCD	alpha-Fucosidase	An enzyme that catalyses the hydrolysis of an alpha-l-fucoside, producing an alcohol and l-fucose; a deficiency of the lysosomal enzyme will result in fucosidosis. (http://cancerweb.ncl.ac.uk/)
AGCE	Angiotensin converting enzyme	An enzyme of the hydrolase class that catalyses cleavage of the leucine leucine bond in angiotensin to generate angiotensin. The enzyme is synthesised as inactive prorenin in the kidney and released into the blood in the active form in response to va
AGCT	alpha-Galactosidase	An enzyme that catalyses the hydrolysis of terminal, non-reducing alpha-d-galactose residues in alpha-galactosides including galactose oligosaccharides, galactomannans, and galactolipids. (http://cancerweb.ncl.ac.uk/)
AGKN	Arginine kinase	Acts to maintain steady-state ATP concentrations by mobilizing stores of high energy phosphate during periods of rapid ATP hydrolysis
AGSE	alpha-Glucosidase	Enzymes that catalyze the exohydrolysis of 1,4-alpha-glucosidic linkages with release of alpha-glucose. Also known as alpha-D-Glucoside glucohydrolases (http://cancerweb.ncl.ac.uk/)
AGTF	Alanine gamma-glutamyltransferase	an enzyme

ENZ ENZYME EFFECT		
AHDX	Aniline Hydroxylase	
<AHHD>	Aryl Hydrocarbon Hydrolase	
AKPT	Alkaline protease	These proteases work best in the pH range of 8 to 11 and are used widely in washing powders and to de-hair hides.
AKPY	Alkaline pyrophosphatase	A group of enzymes within the class EC 3.6.1.- that catalyze the hydrolysis of diphosphate bonds, chiefly in nucleoside di- and triphosphates. They may liberate either a mono- or diphosphate.
ALAD	(Delta) Δ - Aminolevulinic Acid Dehydratase	Also known as (Delta) Δ -Aminolevulinic Acid Dehydrase.
ALAS	(Gamma) Γ -ala Synthetase	
ALDH	Aldehyde dehydrogenase (ALDH)	An enzyme that catalyzes the conversion of an aldehyde to its corresponding acid.
ALDO	Aldolase	An enzyme in anaerobic glycolysis that catalyzes the cleavage of fructose 1,6-diphosphate to glyceraldehyde 3-phosphate.
ALIE	Ali esterase	Ali esterase also known as carboxylesterase which catalyzes a carboxylic ester to yield an alcohol and carboxylic acid anion; has wide specificity; also hydrolyzes vitamin a esters; can be used to separate stereoisomers; consider also esterase b which is a serine protease.
ALLN	Allantoinase Activity	
ALPH	Alkaline Phosphatase	
ALTM	Alanine transaminase	An enzyme that catalyses the conversion of l-alanine and 2-oxoglutarate to pyruvate and l-glutamate. (Gray's)
AMYL	Alpha-amylase	
AMNS	alpha-Mannosidase	Catalyses hydrolysis of terminal, non-reducing alpha-d-mannose residues in alpha-d-mannosides. Also known as alpha-d-mannoside mannohydrolase, alpha-d-mannosidase, neutral alpha-mannosidase, alpha mannosidase a, alpha mannosidase b, lysosomal alpha-mannosidase, laman. (http://cancerweb.ncl.ac.uk/)

ENZ ENZYME EFFECT		
AMTR	Arsenite methyltransferase	An enzyme of the biotransformation pathway that forms methylarsonate from inorganic arsenite.
ANAE	A-naphthyl Acetate Esterase	
APND	Aminopyrine N-demethylase	
APRT	Acid Protease	Any of many protein-hydrolyzing enzymes that work best in an acidic solution (usually in a pH range of 2-6). Such proteases include the stomach enzymes pepsin and rennin
APYR	Acid pyrophosphatase	A group of enzymes within the class EC 3.6.1.- that catalyze the hydrolysis of diphosphate bonds, chiefly in nucleoside di- and triphosphates. They may liberate either a mono- or diphosphate.
ARMT	Aromatase	An enzyme which converts androgens to estrogens by desaturating ring a of the steroid. This enzyme complex is located in the endoplasmic reticulum of estrogen-producing cells including ovaries, placenta, testicular sertoli and leydig cells, adipose, and b. Also known as Estrogen synthetase or P450Arom
ASAT	Aspartate Aminotransferase	Usually abbreviated as AST.
ASCP	Ascorbate peroxidase	an enzyme
ASOA	Ascorbic Acid Oxidase Activity	A copper containing enzyme found in higher plants where it catalyses the reversible oxidation of ascorbate to 2-dehydro-ascorbate acid with the concomitant reduction of molecular oxygen to water (http://www.cordis.lu/tmr/src/grants/fair/975021.htm).
ASPT	Arylsulphatase	Aryl sulphatases A, B and C comprise a group of enzymes originally assayed by their ability to hydrolyze O sulphate esters of aromatic substrates. Aryl sulphatase A, substrate cerebroside 3 sulphate, is deficient in metachromatic leukodystrophy. Aryl sulphatase B, substrate acetylhexosamine 4 sulphate in glycosaminoglycans, is deficient in Maroteaux-Lamy syndrome. Aryl sulphatase C hydrolyses oestrogen sulphates. All three are deficient in multiple sulphatase deficiency. (cancerweb.ncl.ac.uk)
ATPA	Adenosine Triphosphatase	
ATRP	Alanine Transpeptidase	

ENZ ENZYME EFFECT		
B5P4	b5/P-450	
BAPH	Benzo(a)pyrene Hydroxylase	
BAPM	Benzo(a)pyrene monooxygenase	An enzyme that catalyses the incorporation of one oxygen atom of molecular oxygen into benzo(a)pyrene.
BCHE	Buterylcholinesterase	
BCOD	Butoxycoumarin O-dealkylase	
BGAL	(Beta) B-galactosidase	
BGCR	beta-Glucuronidase	beta-Glucuronidase hydrolyzes conjugated glucuronides. It is ubiquitous in animal lysozymes. The enzyme has found wide application in determining urinary steroids. (http://www.worthington-biochem.com/manual/G/GL.html)
BGMD	beta-Glucosaminidase	Cleaves all non-reducing terminal beta-linked N-acetylglucosamine (http://www.prozyme.com/glycopro/index.html#GE30)
BGSE	beta-Glucosidase	An enzyme that catalyses the hydrolysis of terminal non-reducing residues in beta-d-glucosides with release of beta-glucose. Also known as beta-D-Glucoside glucohydrolase. (http://cancerweb.ncl.ac.uk/)
<BHXA>	Benzpyrene Hydroxylase	
BPND	Benzphetamine-n-demethylase	
BROD	Benzylresorufin O-deethylase	
C2K1	Cytochrome P450 2K1	A microsomal cytochrome p450 isoform protein. (CYP2K1)
C2M1	Cytochrome P450 2M1	A microsomal cytochrome p450 isoform protein. (CYP2M1)
CA27	Cytochrome P450 3A27	A microsomal cytochrome p450 isoform protein. (CYP3A27)
CAAH	Carbonic Anhydrase	

ENZ ENZYME EFFECT		
CACA	Choline Acetyltransferase	
CAPK	Choline phosphokinase	Also known as choline kinase and choline phosphotransferase. An enzyme that is active in the first step of choline phosphoglyceride (lecithin) biosynthesis by catalyzing the phosphorylation of choline to phosphorylcholine in the presence of ATP. (Grey's online medical dictionary)
CATP	Calcium ATPase	
CCAT	Calcium Carbonate ATPase	
CCOX	Cytochrome C-oxidase	
CEST	Cholinesterase	An enzyme found in blood and in various other tissues that catalyzes hydrolysis of choline esters, including acetylcholine.
CHIT	Chitobiase	One of the lysosomal glycosidases called Chitobiase belongs to a special family of proteins that hydrolyze the polysaccharide chitin
CP1A	Cytochrome P1A (CYP1A)	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; P1A = pigment 1A
CPSE	Creatine phosphokinase	An enzyme that is contained in skeletal muscle, smooth muscle and cardiac muscle. Creatine phosphokinase is released into the bloodstream in increased quantities if muscle is injured. Creatine phosphokinase can be fractionated so that specific measurements can be made for blood levels of creatine phosphokinase that comes exclusively from damaged heart muscle. (http://cancerweb.ncl.ac.uk/)
CRKI	Creatine Kinase	An enzyme of vertebrate skeletal and myocardial muscle that catalyzes the transfer of a high-energy phosphate group from phosphocreatinine to adenosinediphosphate with the formation of adenosinetriphosphate and creatinine.
CSYN	Citrate synthase	An enzyme of the lyase class that catalyzes the condensation of oxaloacetate and the acetyl group of coenzyme a to form citrate and coenzyme a. This is the initial reaction in the tricarboxylic acid cycle.
CTHP	Cathepsin	Intracellular proteolytic enzymes of animal tissues, such as cathepsin B, a lysosomal thiol proteinase, C, dipeptidyl peptidase, D, that has pepsin like specificity, G, similar to chymotrypsin, H, that possesses aminopeptidase activity, N, that attacks N terminal peptides of collagen and so on. (Gray's)

ENZ ENZYME EFFECT		
CTLS	Catalase	An enzyme that catalyzes the decomposition of hydrogen peroxide into molecular oxygen and water.
CTMT	Catechol o-methyltransferase	An enzyme of the transferase class that catalyses the transfer of a methyl group from s-adenosylmethionine to a catechol or catecholamine such as dopa, dopamine, norepinephrine, or epinephrine (converting to normetanephrine and metanephrine, respectively)
CYAA	Cytochrome aa3	An enzyme complex of the inner mitochondrial membrane that catalyzes the reaction between ferrocytochrome c and oxygen to yield ferricytochrome c and water. It is associated with the pumping of protons and the resultant phosphorylation of ADP to ATP. The reaction is the terminal event in the electron transport scheme by which oxygen is used for fuel combustion. It is a part of Complex IV of the respiratory chain. A deficiency of one or more of the polypeptides of this complex results in neuronal loss in brain leading to psychomotor retardation and neurodegenerative disease. (http://cancerweb.ncl.ac.uk/omd/contents)
CYAM	Cystine aminopeptidase	Cystine an amino acid combined with Aminopeptidase which is an enzyme that removes the N terminal amino acid from a protein or peptide.(partial definition from http://cancerweb.ncl.ac.uk/)
CY2B	Cytochrome P2B (CYP2B)	One of the intracellular hemoprotein respiratory pigments that are enzymes functioning in electron transport as carriers of electrons
CY2C	Cytochrome P-450 CYP2C	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; found in the endoplasmic reticulum that acts as an intermediary in MFO reactions
CYB5	Cytochrome B-5	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; found in the endoplasmic reticulum that acts as an intermediary in MFO reactions
CYCC	Cytochrome c + c1	Cytochrome c is a type of cytochrome, a protein which carries electrons, that is central to the process of respiration in mitochondria (an organelle found in eukaryotes which produces energy). Cytochrome c1 is the 30-kD membrane-bound c-type protein of mitochondria that functions as an electron donor to cytochrome c in the mitochondrial and bacterial respiratory chain. (http://cancerweb.ncl.ac.uk/omd/contents)

ENZ ENZYME EFFECT		
CYP2	Cytochrome P2	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; found in the endoplasmic reticulum that acts as an intermediary in MFO reactions
CYP3	Cytochrome P3A	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; found in the endoplasmic reticulum that acts as an intermediary in MFO reactions
CYST	Cysteine Dioxygenase	
CYTB	Cytochrome b	Cytochromes (electron-transporting proteins) with protoheme or a related haem as the prosthetic group. The prosthetic group is not covalently bound to the protein moiety. (http://cancerweb.ncl.ac.uk/omd/contents)
CZSD	Copper Zinc superoxide dismutase	CuZn superoxide dismutase (CuZnSOD) catalyses the dismutation reaction of the total superoxide radical to molecular oxygen and hydrogen peroxide. This type of SOD is distinguished by its metal prosthetic group, Cu/Zn. (From Molecular Biophysics Group
DBHD	delta-5-3-beta hydroxysteroid dehydrogenase	Converts dehydroepiandrosterone to delta-4-androstene-3,17-dione
DBHX	Dopamine beta-hydroxylase	This enzyme converts dopamine into norepinephrine (www.behavenet.com/capsules/neurochem/dopaminebetahydroxylase.htm)
DEAS	Dehydroascorbate se	Catalyzes the hydrolysis of the gamma lactone, dehydroascorbate, to diketogulonate. (cancerweb.ncl.ac.uk)
DHYD	NADPH Dehydrogenase	
DSCA	Diethylsuccinase	
DTDP	DT-diaphorase	Prevents the redox cycling of certain compounds
ECOD	Ethoxycoumarin O-deethylase	
ENCL	Endocellulase	An enzyme that is able to break beta 1-4 bonds randomly along a cellulose strand

ENZ ENZYME EFFECT		
ENDM	Ethylmorphine-n-demethylase	
EPHY	Epoxide Hydrase	
EPND	EPN (O-Ethyl-O-p-nitrophenyl phenylphosphonot hionate) detoxification	
EROD	7-Ethoxyresorufin O-deethylase	
ESLI	Esterase lipase	Esterase is an enzyme that catalyses the hydrolysis of organic esters to release an alcohol or thiol and acid. Lipase is an enzyme that catalyses the hydrolysis of fats (monoglycerides, diglycerides and triglycerides) to glycerol and fatty acids. (http://cancerweb.ncl.ac.uk/)
ESST	Estradiol sulfotransferase	Estrogen sulfotransferase (EST) catalyzes the sulfation of estrogens such as estradiol and estrone, using the cofactor 3'-phosphoandenosine- 5'-phosphosulfate (PAPS) (http://www.epa.gov/endocrine/inventory/NIEH-091.html)
ESTE	Esterase	Any group of enzymes that catalyze the synthesis and hydrolysis of esters.
ESTS	Elastase	Serine protease that will digest elastin and collagen type IV, inhibited by α_1 protease inhibitor of plasma. (Gray's)
EXCL	Exocellulase	An enzyme that is able to cleave the glucose molecules from the ends of cellulose strands
F16D	Fructose 1,6-diphosphatase	Fructose 1,6-diphosphatase (FDPase) (also termed fructose 1,6-bisphosphatase) is a focal enzyme in gluconeogenesis via its conversion of fructose 1,6-diphosphate (FDP) to fructose 6-phosphate (F-6-P), which permits endogenous glucose production from
FDPA	Fructose-diphosphate Aldolase	
FESD	Iron superoxide dimutase	Fe superoxide dimutase (FeSOD) caralyses the dimutation reaction of the toxic superoxide radical to molecular oxygen and hydrogen peroxide. This type of SOD is distinguished by its metal prosthetic group, Fe. (From University of Leeds PROMISE database)

ENZ ENZYME EFFECT		
FMOO	Flavin-containing monooxygenase (FMO)	A microsomal enzyme responsible for metabolism of some drugs (http://www.fda.gov/cder/drug/drugReactions/default.htm)
G6PD	Glucose-6-phosphate Dehydrogenase	
G6PT	Glucose-6-phosphatase	An enzyme that catalyzes the conversion of d-glucose 6-phosphate and water to d-glucose and orthophosphate.
GCTA	Glucosyltransferase	An enzyme which transfers residues of glucose (a sugar) to acceptor molecules. (cancerweb.ncl.ac.uk)
GENZ	Enzyme, General	Change in enzyme activity or enzyme protein levels.
GGCS	gamma-Glutamylcysteine synthetase	An enzyme that catalyses the first step in glutathione biosynthesis, reacting l-glutamate, l-cysteine, and ATP to form gamma-glutamylcysteine, ADP, and orthophosphate; inhibited by thiols such as glutathione. (http://cancerweb.ncl.ac.uk)
GGTP	gamma-glutamyl transpeptidase	An enzyme contained in the liver that plays a role in metabolism.
GGTR	(Gamma) Γ -glutamyl Transferase*	
GLAD	Glutamic Acid Dehydrogenase	
GLMC	Glutamate decarboxylase	A pyridoxal-phosphate protein that catalyzes the alpha-decarboxylation of l-glutamic acid to form gamma-aminobutyric acid and carbon dioxide. The enzyme is found in bacteria and in invertebrate and vertebrate nervous systems. It is the rate-limiting enzyme in determining gaba levels in normal nervous tissues. The brain enzyme also acts on l-cysteate, l-cysteine sulfinat, and l-aspartate. (http://cancerweb.ncl.ac.uk/omd/contents)
GLMD	Glutamate Dehydrogenase	
GLMS	Glutamine Synthetase	An enzyme which catalyzes the formation of glutamine from glutamic acid and ammonia, using ATP as a source of energy.

* GGT is also used for gamma glutamyl transpeptidase, a liver enzyme; prior to using the GGTR code verify that indeed GGT is used as the transferase in the current publication. The gamma glutamyl transpeptidase code is GGTP (proposed code).

ENZ ENZYME EFFECT		
GLMT	Glutamate transferase	
GLPP	Glycogen phosphorylase	Enzyme that catalyses the sequential removal of glycosyl residues from glycogen to yield one glucose-1-phosphate per reaction. Its activity is controlled by phosphorylation (by phosphorylase kinase). (http://cancerweb.ncl.ac.uk)
GLPX	Glutathione Peroxidase	Glutathione peroxidase catalyzes the reduction of various organic hydroperoxides, as well as hydrogen peroxide, with glutathione as hydrogen donor
GLRE	Glutathione Reductase	
GLTR	Glucuronyl Transferase	
GLUR	(Beta) B-glucoronidase	
GLUT	Glutaminase	an enzyme
GLYD	Glyceraldehyde Dehydrogenase	
GMPP	Cyclic guanylic acid phosphodiesterase , cGMP PDE	an enzyme involved with the process of sight
GOTR	Glutamic-oxaloacetic Transaminase	
GPIM	Glucose phosphate isomerase	An enzyme that converts glucose-6-phosphate to its positional isomer glucose-1-phosphate
GPTR	Glutamic Pyruvic Transaminase	
GSTR	Glutathione S-transferase	
GTPD	Glutamyl transpeptidase	A membrane-bound glycoprotein necessary for the formation of mercapturic acids from glutathione conjugates, This enzyme has a number of acceptor amino acids and catalyzes three reactions.

ENZ ENZYME EFFECT		
GULO	L-Gulonolactone oxidase	an enzyme which oxidizes l-gulonolactone to 2-keto-l-gulonolactone (http://www.positivehealth.com/permit/Articles/Nutrition/vitc3.htm)
GUPX	Guaiacol Peroxidase	Plant peroxidase. Guaiacol peroxidases have also been found in sterile root exudates and shown to oxidize Mn ²⁺ to form Mn ³⁺ chelates that are capable of decolorizing aromatic dyes. (http://lbewwww.epfl.ch/COST837/PhytoRemed2000_Files/Session2.pdf) Peroxidase is commonly assayed by noting the development of color (A470) during the oxidation of a simple phenolic compound, guaiacol (ortho-methoxyphenol). For every four molecules of H ₂ O ₂ that are reduced, one molecule of tetraguaiacol is formed (http://www-plb.ucdavis.edu/courses/s99/plb111/Enzymes.html).
HAFS	N-Hydroxy-2-acetylaminofluorene sulfotransferase	A growth hormone dependant, liver enzyme involved in the microsomal metabolism of testosterone (58214)
HBDS	alpha-Hydroxybutyrate dehydrogenase	an enzyme
HEPX	Heptachlor epoxidase	
HOXY	Heme oxygenase (Haem oxygenase)	A mixed function oxidase enzyme which during haemoglobin catabolism catalyses the degradation of haem to ferrous iron, carbon monoxide and biliverdin in the presence of molecular oxygen and reduced NADPH. The enzyme is induced by metals, particularly cobalt. (http://cancerweb.ncl.ac.uk)
HPSE	Hydrogen Peroxidase	
HXBH	Hexobarbital Hydroxylase	
HXKN	Hexokinase	Enzyme responsible for glucose phosphorylation to glucose-6-phosphate
ICDH	Isocitrate dehydrogenase	
IPYR	Inorganic pyrophosphate	A chemical that can block bone mineral crystal formation (http://www.homestead.com/hypophosphatasia/files/page8.html)
ITMD	Iodothyronine 5'-monodeiodinase	An intergral membrane bound selenoenzyme (ECOREF#48163)

ENZ ENZYME EFFECT		
LADH	Lactate Dehydrogenase	An enzyme with 5 forms: LDH-1 is in the heart, its blood level can rise when heart muscle is damaged. Other forms can be found in the liver, brain, kidney, skeletal muscle and bone. (http://cancerweb.ncl.ac.uk/) Usually abbreviated as LDH.
LCDH	Lactic dehydrogenase	The enzyme that catalyses the formation and removal of lactate according to the equation: pyruvate + NADH = lactate NAD. (cancerweb.ncl.ac.uk)
LDMD	Lactate Dehydrogenase/malic Dehydrogenase Ratio	
LEAM	Leucine aminopeptidase	An exopeptidase that removes neutral amino acid residues from the N terminus of proteins. (http://cancerweb.ncl.ac.uk/)
LGDD	L-Gulonate dehydrogenase and decarboxylase	Enzymes involved in the metabolism of L-ascorbic acid (58373)
LIPS	Lipase	Any of many enzymes that help break down lipids by catalyzing the fraction of an ester linkage
LNSE	L-Leucyl-beta-naphthylamide splitting enzyme	Frequently used to test for leucine aminopeptidase (ec 3.4.11.1) activity; hydrolyzes naphthylamides of leucine. (http://cancerweb.ncl.ac.uk/)
LYSO	Lysyl oxidase	Extracellular enzyme that deaminates lysine and hydroxylysine residues in collagen or elastin to form aldehydes, that then interact with each other or with other lysyl side chains to form crosslinks. (Gray's)
LYZM	Lysozyme activity	Enzyme found in the secretions (tears) of the lacrimal glands of animals and in nasal mucus, gastric secretions, and egg white. Discovered in 1921 by Sir Alexander Fleming, lysozyme catalyzes the breakdown of certain carbohydrates found in the cell walls of certain bacteria (e.g., cocci). It thus functions, in the case of lacrimal fluid..." name=tag>
MADH	Malic Dehydrogenase	
MALE	Malic Enzyme	
MAOA	Mono Amino Oxidase	

ENZ ENZYME EFFECT		
MCAT	Magnesium Carbonate ATPase	
MCOD	Methoxycoumarin O-dealkylase	
MG6P	Microsomal Glucose 6-phosphatase	
MGAT	Magnesium ATPase	
MLCB	Malathion Carboxylesterase	
MLDA	Malate dehydrogenase	An enzyme that catalyses the conversion of (s)-malate and NAD ⁺ to oxaloacetate and NADH. (http://cancerweb.ncl.ac.uk)
MNSD	Manganese Superoxide Dismutase	
MROD	Methoxyresorufin-o-deethylase	
MUDH	Multiple Dehydrogenases (Measured Total Produced by Soil Microorganisms)	
NABH	N-acetyl-beta-hexosaminidase	
NAAT	Sodium adenosine triphosphatase	
NACR	NADH-cyt c reductase	Nicotinamide adenine dinucleotide cytochrome C reductase
NADH	Nicotinamide adenine dinucleotide (reduced) (NADH)	Activated form of the B vitamin niacin, the first of 5 enzyme complexes of the electron transport chain
NADN	Nicotinamide adenine dinucleotide (oxidized) (NAD)	The oxidized (burned) coenzyme form of Vitamin B3

ENZ ENZYME EFFECT		
NAGD	N-Acetyl-beta-d-glucosaminidase	An enzyme
NCB5	NADH cytochrome B5 reductase	Electron transport proteins found in animals, plants and yeasts.
NCCR	NADPH Cytochrome C Reductase	Nicotinamide adenine dinucleotide phosphate cytochrome C reductase
NCTR	Nicotinamide transferase	Catalyses reversibly the methylation of nicotinamide in the presence of s-adenosylmethionine to yield 1-methylnicotinamide and s-adenosylhomocysteine (Gray's).
NDCC	NADH Cytochrome C Reductase	Nicotinamide adenine dinucleotide cytochrome C reductase
NDDP	NADH-DT-diaphorase	
NDFC	NADH ferricyanide reductase	Nicotinamide adenine dinucleotide phosphate ferricyanide reductase
NDFH	NADPH-ferrihemoprotein reductase	
NDFR	NADH Ferrichrome Reductase	Nicotinamide adenine dinucleotide ferrichrome reductase
NDMT	N-Demethylase	That transfers a methyl group from S adenosyl methionine to a substrate. most commonly encountered in bacterial chemotaxis where the methyl accepting chemotaxis proteins (MCPs) become methylated in the course of adaptation. Also known as methyltransferase.
NDPD	NADPH-Diaphorase (Nicotinamide Adenine Dinucleotide phosphate Diaphorase)	
NHCR	NADH cytochrome C reductase	
NITG	Nitrogenase Activity	

ENZ ENZYME EFFECT		
NKAT	Sodium Potassium ATPase	
NNDE	Nitrosamine-N-demethylase	an enzyme
NRDT	Nitrate Reductase	
NRED	Nitroreductase	Enzymes which reduce nitro groups. (cancerweb.ncl.ac.uk)
O1LH	omega-1-laurate hydroxylase	Steroid metabolizing enzyme (62306)
O2LH	omega-2-laurate hydroxylase	Steroid metabolizing enzyme (62306)
OLHD	omega laurate hydroxylase	Steroid metabolizing enzyme (62306)
ORCT	Ornithine Carbamoyl Transferase	
ORDC	Ornithine decarboxylase	The enzyme that converts ornithine to putrescine (dibasic amine) by decarboxylation. Rate limiting in the synthesis of the polyamines spermidine and spermine that regulate DNA synthesis. (http://cancerweb.ncl.ac.uk)
P1A1	Cytochrome P-450 1A1	An isoenzyme translation product of the P450 subfamily 1A CYP1A gene. (ECOREF#61237)
P420	Cytochrome P-420	Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; found in the endoplasmic reticulum that acts as an intermediary in MFO reactions.
P450	Cytochrome P-450	Isoenzyme, Electron transfer hemeprotein having a mode of action in which the transfer of a single electron is effected by the reversible valence change of the central iron atom of the heme prosthetic group; P450 - 450 nm maximum absorption - found in the liver endoplasmic reticulum, the renal brush border the the outer membrane of the adrenal mitochondria; serves as an intermediate electron carrier in reactions catalyzed by some monooxygenases; active in detoxification of xenobiotics by activating the molecular oxygen for an attack on the substrate
PBES	Phenyl Benzoate Esterase	

ENZ ENZYME EFFECT		
PBHD	Pentobarbital Hydroxylase	
PCCX	Picolinate carboxylase	An enzyme
PCHE	Pseudocholinesterase	<p>An enzyme involved in the breakdown of acetylcholine. Associated with acetylcholinesterase. Acetylcholinesterase is found in nerve tissue while pseudocholinesterase is found primarily in the liver.</p> <p>Measurement of pseudocholinesterase may be performed as a screening tool prior to the administration of electroconvulsive therapy. It is also useful in identifying organophosphate toxicity or congenital enzyme deficiencies.</p>
PCLX	Picoline carboxylase	One of several carboxy-lyases, trivially named carboxylases or decarboxylases (EC subclass 4.1.1), catalyzing the addition of CO ₂ to all or part of another molecule to create an additional -COOH group (e.g., ribulose-1,5-bisphosphate carboxylase).
PCOD	Propoxycoumarin O-dealkylase	
PCTN	Pectinase activity	Random hydrolysis of 1,4- α -D-galactosiduronic linkages in pectate and other galacturonans Also called Polygalacturonase or Pectin depolymerase (http://www.expasy.ch/cgi-bin/nicezyme.pl?3.2.1.15)
PFRC	Phosphofructokinase	An enzyme that functions in carbohydrate metabolism and especially in glycolysis by catalyzing the transfer of a second phosphate (as from ATP) to fructose
PKSC	Protein kinase C	An enzyme that phosphorylates proteins on serine or threonine residues in the presence of physiological concentrations of calcium and membrane phospholipids. (http://cancerweb.ncl.ac.uk)
PHLA	Phosphorylase A	The phosphorylated and more active form of phosphorylase that functions as a regulatory enzyme during glycogen breakdown. The phosphate groups are hydrolytically removed by phosphorylase phosphatase to form phosphorylase b and orthophosphate.
PHLD	Phenoloxidase	
PNAC	para-Nitrophenyl Acetate Carboxylase	
PNAD	P-nitroanisole Demethylase	

ENZ ENZYME EFFECT		
PNMT	Phenylethanolamine N-methyl transferase	A methyltransferase that catalyses the reaction of S-adenosyl-L-methionine and phenylethanolamine to yield S-adenosyl-L-homocysteine and N-methylphenylethanolamine. It can act on various phenylethanolamines and converts norepinephrine into epinephrine. (Gray's)
PNOD	para-Nitrophenetole-O-deethylase	
PODA	Peroxidase (Pod) Enzyme Activity	An enzyme that catalyzes reactions in which hydrogen peroxide is an electron acceptor.
PPHL	Phosphorylase	Enzyme that catalyses the sequential removal of glycosyl residues from glycogen to yield one glucose-1-phosphate per reaction. Its activity is controlled by phosphorylation (by phosphorylase kinase). (http://cancerweb.ncl.ac.uk)
PPOX	Polyphenol oxidase	Catechol oxidase - any group of enzymes of the oxidoreductase class that catalyze the oxidation of catechols to 1,2-benzoquinones. The group includes enzymes called also diphenol oxidase or polyphenol oxidase, based on their substrates (Dorlands).
PPPA	Phosphoenolpyruvic acid	Also known as Phosphoenolpyruvate carboxykinase. An enzyme that catalyses the reaction of oxaloacetate and GTP to form phosphoenolpyruvic acid, CO ₂ , and GDP; a key enzyme in gluconeogenesis; the biosynthesis of this enzyme is decreased by insulin. (http://cancerweb.ncl.ac.uk)
PPPC	Phosphoenolpyruvate carboxylase	An enzyme with high affinity for carbon dioxide. It catalyzes irreversibly the formation of oxaloacetate from phosphoenolpyruvate and carbon dioxide. This fixation of carbon dioxide in several bacteria and some plants is the first step in the biosynthesis of glucose.
PROD	Pentylresorufin O-deethylase	
PRTA	Proteolytic activity	An enzyme that promotes proteolysis (= the splitting of proteins by hydrolysis of the peptide bonds with formation of smaller polypeptides).
PRTS	Protease	An enzyme that digests proteins
PSPM	Phosphoamidase	An enzyme catalyzing the hydrolysis of phosphorus-nitrogen bonds, notably the hydrolysis of N-phosphocreatine to creatine and orthophosphate. (http://cancerweb.ncl.ac.uk/)
PYKN	Pyruvate kinase	A phosphotransferase that catalyzes reversibly the phosphorylation of pyruvate to phosphoenolpyruvate in the presence of ATP. It has four isozymes (l, r, m1, and m2).

ENZ ENZYME EFFECT		
PYRC	Pyruvate carboxylase	An enzyme of the ligase class that catalyzes the irreversible carboxylation of pyruvate to form oxaloacetate. The enzyme is a mitochondrial protein containing a biotin prosthetic group, requiring magnesium or manganese and acetyl CoA, and occurs in l
QNPT	Quinolate phosphoribosyltransferase	An enzyme
RBPC	Ribulose-1,5-bisphosphate carboxylase	A copper protein that catalyzes the formation of 2 moles of 3-phosphoglycerate from ribulose 1,5-bisphosphate in the presence of carbon dioxide and is responsible for carbon dioxide fixation in photosynthesis.
RNIN	Renin	An enzyme of the hydrolase class that catalyses cleavage of the leucine leucine bond in angiotensin to generate angiotensin. The enzyme is synthesized as inactive prorenin in the kidney and released into the blood in the active form in response to va
RNPH	5'-Ribonucleotide phosphohydrolase	Common name: 5'-nucleotidase. A glycoprotein enzyme present in various organs and in many cells. The enzyme catalyses the hydrolysis of a 5'-ribonucleotide to a ribonucleoside and orthophosphate in the presence of water. It is cation-dependent and exists in a membrane-bound and soluble form. (http://cancerweb.ncl.ac.uk)
RNSE	Rnase (ribonuclease)	An enzyme that catalyzes the depolymerization of ribonucleic acid.
RUBI	Ribulose bisphosphate carboxylase/oxygenase (Rubisco)	A rate regulating-enzyme in photosynthesis and a key enzyme in nitrogen metabolism (http://www.irri.org/IRRN24-1Minireviews.pdf).
SASE	Arylsulfatase	An enzyme that cleaves phenol sulfates, including cerebroside sulfates. Some arylsulfatases are inhibited by sulfate (type II) and some are not (type I). Synonym: sulfatase. (cancerweb.ncl.ac.uk)
SBDH	Sorbitol Dehydrogenase	
SCDH	Succinate Dehydrogenase	
SFTA	Sulfotransferase	Generic term for enzymes in EC sub-subclass 2.8.2 catalyzing the transfer of a sulfate group from 3'-phosphoadenylyl sulfate (active sulfate) to the hydroxyl group of an acceptor, producing the sulfated derivative and 3'-phosphoadenosine 5'-phosphate

ENZ ENZYME EFFECT		
SGOT	Serum Glutamate Oxalo Acetate Transaminase	
SGPT	Serum Glutamic Pyruvic Transaminase	
SODA	Super Oxide Dismutase (SOD) Enzyme Activity	
SPGX	Selenium dependent glutathion peroxidase	Selenium has a main role as an antioxidant in the enzyme selenium-glutathione-peroxidase (http://www.uphs.upenn.edu/ency/article/002414.htm)
SSAR	Serum Glutamate Oxalo Acetate Transaminase and Serum Glutamic Pyruvic Transaminase to Alkaline Phosphatase ratio (SGOT & SPGT to ALPH ratio)	Ratio of Serum Glutamate Oxalo Acetate Transaminase and Serum Glutamic Pyruvic Transaminase to Alkaline Phosphatase
SSRA	Serum Glutamate Oxalo Acetate Transaminase to Serum Glutamic Pyruvic Transaminase ratio (SGOT to SPGT ratio)	Ratio of Serum Glutamate Oxalo Acetate Transaminase to Serum Glutamic Pyruvic Transaminase
SUPS	Sucrose phosphate synthase	A type 2a phosphoprotein phosphatase (Gray's)
T16A	Testosterone 16-alpha hydroxylase	an enzyme that acts on testosterone at the 16-alpha position
TAMN	Transaminase	One of a group of enzymes that catalize the transfer of the aminogroup of an amino acid to a keto acid to form another amino acid. Also known as aminotransferase.

ENZ ENZYME EFFECT		
TATS	Tyrosine aminotransferase	An enzyme that catalyses the reversible reaction of l-tyrosine and alpha-ketoglutarate producing p-hydroxyphenylpyruvate and l-glutamate; this enzyme catalyses a step in l-phenylalanine and l-tyrosine catabolism; a deficiency of this enzyme is associ
TBHY	Testosterone 16 beta-hydroxylase	An enzyme that acts on testosterone at the 16-beta position
THMN	Thiaminase	<p>1. An enzyme present in raw fish that destroys thiamin and may produce thiamin deficiency in animals on a diet largely composed of raw fish.</p> <p>2. A hydrolase cleaving thiamin into a pyrimidine moiety (i.e., 2-methyl-4-amino-5-hydroxymethylpyrimidine) and a thiazole moiety (i.e., 4-methyl-5-(2'-hydroxyethyl)-thiazole); the pyrimidine moiety may appear in the urine as pyramin.</p>
THTR	Thiol Transferase	
TPHX	Tryptophan hydroxylase	Tryptophan hydroxylase (TPH) is the rate-limiting enzyme in the biosynthesis of serotonin and an important component of melatonin biosynthesis.
TPOX	Tryptophan oxidase	A protohemoprotein. Forms formylkynurenine from l-tryptophan and molecular oxygen. (Gray's)
TRBA	Tributylinase	
TRIE	Triacetin Esterase	
TSHX	Tyrosine hydroxylase	Enzyme required for the synthesis of the neurotransmitters noradrenaline and dopamine. (Gray's)
TSKT	Transketolase	a thiamine pyrophosphate containing enzyme that links the pentose phosphate pathway with glycolysis by converting pentoses to hexoses (Lindqvist, Y., et. al. (1992) EMBO J. 11, 2373-2379. and cancerweb.ncl.ac.uk)
TT2A	Testosterone 2-alpha hydroxylase	<p>From mouse liver, member of the murine cytochrome p450 2d family; amino-terminal amino acid sequence given in first source Registry</p> <p>Synonym: cytochrome p450 2alpha, cytochrome p-450 2alpha, androstenedione 2alpha-hydroxylase, androgen 2alpha-hydroxylase. (http://cancerweb.ncl.ac.uk/omd/contents)</p>
TT6A	Testosterone 6-alpha hydroxylase	An enzyme that acts on testosterone at the 6-alpha position

ENZ ENZYME EFFECT		
TT6B	Testosterone 6-beta-hydroxylase	Pcn2 is an allelic variant form (2 amino acid alterations); for cyp3a2, consider also lidocaine n-deethylase. Synonyms: cytochrome p450(6 beta), cytochrome p-450 6b-1(pb1), cyp6b1, testosterone 6beta-hydroxylase, cyt p450 6beta-3, cytochrome p450(pcn2), 6beta-a gene product, cyp3a2, cyp6b3 (http://cancerweb.ncl.ac.uk)
TT7A	Testosterone 7alpha-hydroxylase (cyp2A1)	An enzyme that acts on testosterone at the 7-alpha position
TTRH	Testosterone hydroxylase	An enzyme that acts at positions 6 alpha, 7 alpha and 16 alpha of testosterone
TUOX	Thiourea oxygenase	an enzyme
TYKN	Thymidine kinase	Of pyrimidine salvage, catalysing phosphorylation of thymine deoxyriboside to form its 5' phosphate, the nucleotide thymidylate. (Gray's)
UDGT	UDP glucuronosyltransferase	The enzymatic addition of sugars to fat-soluble chemicals is an important process that increases their solubility in water and aids in their excretion. In mammals, glucuronic acid is the main sugar that is used to prevent the accumulation of waste products of metabolism and fat-soluble chemicals from the environment to toxic levels in the body. The UDP glucuronosyltransferases that carry out this reaction are part of a super family of UDP glycosyltransferases found in animals, plants and bacteria. (www.unisa.edu.au/pharm_medsci/Gluc_trans/intro.htm)
UDPT	Uridine Diphosphate (Udp) Glucuronyl Transferase	
URON	Uronolactonase	Also known as glucuronolactonase, an enzyme involve in the metabolism of L-ascorbic acid(58373)
URSE	Urease Activity	
VAAM	Valine aminopeptidase	Valine, an amino acid combined with aminopeptidase which is an enzyme that removes the N terminal amino acid from a protein or peptide.(partial definition from http://cancerweb.ncl.ac.uk/)
XBME	Xenobiotic metabolizing enzymes	Enzymes that metabolize synthetic compounds not normally found in nature. Examples of xenobiotic compounds include; pesticides, herbicides, insecticides, fungicides, detergents, plastics and other synthetic polymers.

ENZ ENZYME EFFECT		
XODA	Xanthine Oxidase	

HRM HORMONE EFFECT		
Measurement Code	Measurement Name	Measurement Definition
11DC	11-Deoxycortisol	The immediate precursor of cortisol, accumulates in the peripheral circulation when there is a deficiency of adrenal 11b-hydroxylase activity. (http://www.sas-centre.org/hormones/hormpages/hormone11deoxycortisol.html)
16AT	16alpha-Testosterone	Male sex hormone (androgen) secreted by the interstitial cells of the testis of mammals and responsible for triggering the development of sperm and of many secondary sexual characteristics. (Gray's)
18HC	18-Hydroxycorticosterone	A group of corticosteroids carrying hydroxy groups, usually in the 11- or 17- positions. They comprise the bulk of the corticosteroids used systemically. As they are relatively insoluble in water, salts of various esterified forms are often used for injections or solutions. (Gray's)
18HD	18-Hydroxy-11-deoxycorticosterone	a potassium retaining hormone
6BTT	6beta-Testosterone	Male sex hormone (androgen) secreted by the interstitial cells of the testis of mammals and responsible for triggering the development of sperm and of many secondary sexual characteristics. (Gray's)
7ATT	7alpha-Testosterone	Male sex hormone (androgen) secreted by the interstitial cells of the testis of mammals and responsible for triggering the development of sperm and of many secondary sexual characteristics. (Gray's)
ABSA	Absciscic Acid	A common plant hormone that inhibits plant growth
ACTH	Adrenocorticotrophic hormone	A hormone that stimulates adrenal steroid biosynthesis.
ADDL	Androstanediol	A steroid metabolite (Grey's on-line medical dictionary)
ADDN	Androstenedione	An androgenic steroid produced by the testis, adrenal cortex and ovary. It occurs in nature as a 4-delta-androstenedione and 5-delta-androstenedione. Androstenediones can be converted metabolically to testosterone and other androgens. (Grey's on-line medical dictionary)
AHPG	17 alpha-Hydroxyprogesterone	Also known as:17a-Hydroxy-4-pregnen-3,20-dione. A precursor of the androgens and adrenocortical hormones. (http://cancerweb.ncl.ac.uk)

HRM HORMONE EFFECT		
ALDS	Aldosterone	A steroid hormone produced by the adrenal cortex, that controls salt and water balance in the kidney. Abnormally high levels of this hormone cause sodium retention, high blood pressure, heart rhythm irregularities and possibly paralysis (Gray's)
AMSH	Alpha-Melanocyte Stimulating Hormone	Alpha-Melanocyte Stimulating Hormone (alpha-MSH) is produced by an intermediate lobe of the pituitary gland. Its secretion causes a dramatic darkening of the skin.
ANDR	Androgen	Substances that conduces masculinization; such as testicular hormones
AUXN	Auxin	A plant hormone
BDPG	17,20beta-Dihydroxy-4-pregnen-3-one	A female preovulatory hormone
<BOES> Code ESDL	beta-Oestradiol (E2)	A hormone (272 D) synthesised mainly in the ovary, but also in the placenta, testis and possibly adrenal cortex. A potent oestrogen. (cancerweb.ncl.ac.uk)
CORT	Corticosterone (Corticoid)	A steroid produced by the adrenal cortex that stimulates carbohydrate synthesis and protein breakdown.
CRCT	Cortisol and cortisone	Cortisol is a steroid hormone that is released from the zona fasciculata of the adrenal cortex in response to stress. Cortisone: Derived from cortisol and with similar physiological actions. (http://cancerweb.ncl.ac.uk)
CRTS	Cortisol	Cortisol is a steroid hormone that is released from the zona fasciculata of the adrenal cortex in response to stress.
CTCL	Catecholamine	A type of biogenic amine derived from tyramine, characterised as alkylamino derivatives of o dihydroxybenzene. Catecholamines include adrenaline, noradrenaline and dopamine, with roles as hormones and neurotransmitters.
CYTK	Cytokinin	Class of plant hormones that induce cell division
DECL	11-Deoxycortisol glucuronide	11-Deoxycortisol is the immediate precursor of cortisol, accumulates in the peripheral circulation when there is a deficiency of adrenal 11b-hydroxylase activity. (http://www.sas-centre.org/hormones/hormpages/hormone11deoxycortisol.html) Glucuronide is a substance produced by attaching glucuronic acid to another substance with glycosidic bonds (http://cancerweb.ncl.ac.uk)
DHTR	Dihydrotestosterone	The synthetic form is stanolone. (5alpha,17beta)-17-Hydroxyandrostane-3-one (Dorland's medical dictionary)

HRM HORMONE EFFECT		
DITS	Diiodotyrosine	One of the hormones that are combined to create T3 (triiodotyrosine), Diiodotyrosine (DIT); tyrosine is iodinated twice.
DOCS	Deoxycorticosterone	Also known as 11-Deoxycorticosterone; 21-hydroxypregn-4-ene-3,20-dione. An adrenocortical steroid, principally a biosynthetic precursor of corticosterone and possibly aldosterone, that rarely appears in adrenocortical secretions; a potent mineralocorticoid with no appreciable glucocorticoid activity. (http://cancerweb.ncl.ac.uk)
DOPA	Dopamine	A monoamine formed in the body; an intermediate product in the synthesis of norepinephrine, acts as a neurotransmitter in the CNS
ELTR	17beta-estradiol:Testosterone ratio	The ratio of the amount of 17beta-estradiol to the amount of testosterone in an organism
EPIN	Epinephrine	Secreted by the adrenal medulla and acts to increase blood pressure due to the stimulation of heart action and constriction of blood vessels (adrenaline)
ESDL	17-beta Estradiol	An estrogenic hormone produced by follicle cells of the ovary; provokes estrus and proliferation of the human endometrium.
ESTR	Estrogen (oestrogen)	Any of various natural or synthetic substances possessing the biological activity of estrus-producing hormones.
FOSH	Follicle stimulating hormone (FSH)	One of the most important hormones involved in the natural menstrual cycle as well as in pharmacological (drug-induced) stimulation of the ovaries. It is the main hormone involved in producing mature eggs.
GBDP	Glucuronidated 17,20beta-Dihydroxy-4-pregnen-3-one	A female preovulatory hormone with glucuronidate
GCRT	Glucocorticoid	Corticosteroid substances (drugs or hormones) that are involved in carbohydrate metabolism by promoting gluconeogenesis and the formation of glycogen at the expense of lipid and protein synthesis. They are steroid based and possess anti-inflammatory and immunosuppressive properties. Glucocorticoids are also produced normally by the adrenal cortex and provide for the response to stress. (http://cancerweb.ncl.ac.uk/)
GHRM	Hormone, General Changes in	Change in hormone concentrations.
GIBB	Gibberellin	A plant hormone
GNTF	Gonadotropin	A substance that acts to stimulate the gonads.

HRM HORMONE EFFECT		
GRHM	Gonadotropin releasing hormone	The peptide hormone that control reproductive function. It produced and released by the hypothalamus and controls the production and release of gonadotrophins from the pituitary gland. It causes the production of luteinising hormone and follicle stimulating hormone. (http://cancerweb.ncl.ac.uk/omd/contents)
GTHH	Growth hormone	A polypeptide hormone secreted by the anterior pituitary which promotes an increase in body size. Any hormone that regulates growth in plants and animals.
INHI	Inhibin	Polypeptide hormone secreted by the hypophysis, that selectively suppresses the secretion of pituitary follicle stimulating hormone. The molecule has two subunits (14 & 18 kD) and is a product of the gene family that includes TGF β . There are two forms, α A and α B, the α subunit being shared with activin. Inhibin is now, on the basis of gene knockout experiments, considered to be a tumour suppressor, the key gene being that for inhibin. (http://cancerweb.ncl.ac.uk/omd/contents)
INSL	Insulin	A polypeptide hormone found in both vertebrates and invertebrates. Secreted by the cells of the pancreas in response to high blood sugar levels, it induces hypoglycemia. Defective secretion of insulin is the cause of diabetes mellitus. Insulin is also a mitogen, has sequence homologies with other growth factors and is a frequent addition to cell culture media for demanding cell types. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?insulin)
IPTH	Immunoreactive parathyroid hormone	
KTST	11-Ketotestosterone	Steroid hormone produced by the testes, along with testosterone responsible for the appearance of male secondary sex characteristics.
LUTH	Luteinizing hormone (LH)	stimulates secretion of sex steroids from the gonads
ME4T	Total 4a-Methylsterols	Sterol - steroids with long aliphatic side chains at position 17 and at least one alcoholic hydroxyl group, usually at position 3 with lipid-like solubility
MITS	Monoiodotyrosine	One of the hormones that are combined to create T3 (triiodotyrosine), Monoiodotyrosine (MIT); tyrosine becomes iodinated.
NORD	Noradrenaline	Catecholamine neurohormone, the neurotransmitter of most of the sympathetic nervous system (of so called adrenergic neurons): binds more strongly to α adrenergic receptors. Stored and released from chromaffin cells of the adrenal medulla. (http://cancerweb.ncl.ac.uk/omd/contents)

HRM HORMONE EFFECT		
NORE	Norepinephrine	Secreted by chromaffin cells of the adrenal medulla; acts as a vasoconstrictor and mediates transmission of sympathetic nerve impulses.
PRGN	Pregnenolone	An unsaturated hydroxy steroid ketone C ₂₁ H ₃₂ O ₂ that is formed by the oxidation of steroids (as cholesterol) and yields progesterone on dehydrogenation.(www.m-w.com)
PRLC	Prolactin	A protein hormone produced by the adenohypophysis; stimulates lactation and promotes functional activity of the corpus luteum.
PRGS	Progesterone	A steroid produced in the corpus luteum, placenta, testes, and adrenals; plays an important physiological role in the luteal phase of the menstrual cycle and in the maintenance of pregnancy.
SMTc	Somatomedin C (or IGF-1)	Somatotropin or human growth hormone is secreted by the pituitary gland under the influence of growth hormone releasing hormone. IGF-I is the main effector of growth hormone activity. ³ IGF-I or Somatomedin C is the major member of a family of proteins synthesized by the liver in response to growth hormone stimulus. It circulates in the peripheral blood bound on a tertiary complex with IGFBP-3 and acid labile subunit (ALS) (http://www.aal.xohost.com/IGF-1.htm)
SRIF	Somatostatin	A polypeptide hormone that is produced by the hypothalamus and inhibits the release of growth hormone by the anterior pituitary. It is also produced in the delta cells of the endocrine pancreas where it inhibits the secretion of insulin and glucagon and decreases intestinal motility and absorption. (www.harcourt.com/dictionary)
SRTN	Serotonin	A vasoconstrictor, serves as a central neurotransmitter, also called 5-Hydroxytryptamine
ST5T	Total (Delta)5-sterols	Sterol - steroids with long aliphatic side chains at position 17 and at least one alcoholic hydroxyl group, usually at position 3 with lipid-like solubility
ST8T	Total (Delta)8-sterols	Sterol - steroids with long aliphatic side chains at position 17 and at least one alcoholic hydroxyl group, usually at position 3 with lipid-like solubility
STRD	Steroids	A group name for lipids that contain a hydrogenated cyclopentanoperhydrophenanthrene ring system. Some of the substances included in this group are progesterone, adrenocortical hormones, the gonadal hormones, cardiac aglycones, bile acids, sterols (such as cholesterol), toad poisons, saponins and some of the carcinogenic hydrocarbons. (Gray's Medical)
T3T4	Triiodothyronine (T3) to thyroxine (T4)	The ratio of Triiodothyronine (T3) to Thyroxine (T4).

HRM HORMONE EFFECT		
T4T3	Thyroxine:Triiodothyronine	The ratio of Thyroxine (T4) and Triiodothyronine (T3).
TGLD	Testosterone glucuronide	A metabolite of testosterone. Testosterone glucuronide comes from the hepatic transformation of testosterone, DHT and androstenedione (http://www.estetik.com/datamed/Anti_Aging/male_hormones.htm)
THYR	Thyroxine	(T4) an iodine-containing hormone C ₁₅ H ₁₁ I ₄ NO ₄ that is an amino acid produced by the thyroid gland as a product of the cleavage of thyroglobulin, increases metabolic rate.
TRII	Triiodothyronine	(T3) an iodine-containing hormone C ₁₅ H ₁₂ I ₃ NO ₄ that is an amino acid derived from thyroxine, the more active form of thyroid hormone which crosses cell membranes to exert an effect on metabolic rates within an organism.
TSHT	Thyrotropin	Thyrotropin or thyroid-stimulating hormone (TSH), is a hormone released by the anterior pituitary gland that stimulates the thyroid gland to release thyroxine.
TSTR	Testosterone	A steroid hormone which is necessary for male sexual reproduction and may also play a role in female sexual response. It is responsible for such male secondary sexual characteristics as body hair. In males, is produced in the Leydig cells of the testes; in both sexes, it is produced in smaller quantities by the adrenal glands.

GRO GROWTH¹ GROUP

DVP DEVELOPMENT EFFECT		
Measurement Code	Measurement Name	Measurement Definition
68CL	6-8 Cell stage	Cleavage stage during embryonic development which contains 6-8 cells.
ABNM	Abnormal	ECOTOX makes every effort to code the specific abnormalities (e.g. imposex, limb deformities, lesions, etc.), but when an author does not clearly state the specific type of abnormality or combines multiple types of abnormalities into one data point DVP ABNM is used.
BSCY	Blastocyst stage	An early metazoan embryo typically having the form of a hollow fluid-filled rounded cavity bounded by a single layer of cells
CCLV	Cell Cleavage	
COLR	Color	
DFRM	Deformation/ Malformations	A physical blemish or distortion

DVP DEVELOPMENT EFFECT		
DVLP	Slowed, Retarded, Delayed or Non-development	
EMRG	Emergence	Change in the emergence from larval stage into the adult stage. Also includes plant emergence.
ENDD	Endoderm Differentiation	
EVFO	Envelope Formation	
EYOP	Eye opening	The development stage when the eyes open.
FIRM	Firmness	
FLDG	Fledged/Female or /Brood	
FORM	Organ/Tissue Formation	
GDVP	Development, General	Change in ability to grow to a more mature life stage and in time between separate life stages; Used when more than one measurement is coded for an ACQUIRE record.
GRRT	Growth Rate	
GSTL	Gastrulation	
INCT	Incubation time	To maintain (as an embryo or a chemically active system) under conditions favorable for hatching, development, or reaction (Webster's)
LRCF	Loricae formation	Tintinnid ciliates form stiff, vase-shaped or barrel-shaped coverings called loricae, around themselves.
MATR	Maturation	The process of coming to full development.
MMPH	Metamorphosis	A marked structural change in an animal during postembryonic development.
MOLT	Molting	To shed an outer covering as part of periodic process of growth.
MRLA	Morula stage	a globular solid mass of blastomeres formed by cleavage of a zygote that typically precedes the blastula

DVP DEVELOPMENT EFFECT		
NORM	Normal	
PHRN	Post Harvest Character No Effect	
PHRV	Post Harvest Character Influenced	
PUPA	Pupation	Change in percent pupation or pupation duration.
RSPN	Resorption (Tail Resorption in Frogs)	
STGE	Stage of development	a period or step in a progress, activity, or development; especially : one of the distinguishable periods of growth and development of a plant or animal (http://www.m-w.com)
SXDP	Sexual Development	
TEMR	Time to First Emergence	
TERA	Teratogenesis	Use this code when exposure of adults results in quantifiable occurrence of abnormal offspring.
TFLW	Time to Flower	
THED	Time to heading	The time it take for grain to reach maturity.
TRRA	Transformation Ratio	(Weight of Roots + Sprouts/weight of Original Seed)
WEAN	Weaned	
WGHT	Weight	The heaviness of an object.
YLKA	Yolk sac absorption, Yolk sac utilization	A bag-like ventral extension of the gut containing nutritive materials that first appears in the fish embryo and is later absorbed by the larva during the stage after hatching and before feeding. (filaman.uni-kiel.de/LarvalBase/Glossary)

GRO GROWTH EFFECT		
Measurement Code	Measurement Name	Measurement Definition

GRO GROWTH EFFECT		
<ABNM>	Abnormal	DO not code GRO ABNM. ABNM should be coded under MPH (when adult body structures are changing) or DVP (when embryo or juveniles are becoming abnormal throughout different lifestages)
AREA	Area	Change in area of an entire organism. (Use AREA MPH (Morphology) when measuring specific response sites.
BMAS	Biomass	Includes harvest yield, fruit or seed yield, mass of population, standing crop, productivity.
<BDBN>	Body Burden	This will need maintenance. If the measurement occurs with and endpoint than the measurement should change to EBCN.
COND	Condition Index	Fitness factor.
DNSY	Density	
DMTR	Diameter	
DIST	Distance grown	
DWGT	Dry Weight (AQUIRE Only)	Measurable change in dry weight of test organism.
EBCN	Effective Body Concentration	The body residue of a chemical that is associated with an effect.
GAIN	Weight gain	Increase in body weight over existing weight. (http://cancerweb.ncl.ac.uk)
GGRO	Growth, General	Used when more than one measurement is coded for an AQUIRE record.
<GGRT>	Growth Rate Index	
GREI	Growth Efficiency Index	
HGHT	Height	Measurable change in height of test organism.
LGTH	Length	Measurable change in length of test organism.
LINT	Lint	A fibrous coat of thick convoluted hairs borne by cotton seeds that yields the cotton staple (MW online).
NGAN	Net gain	Net weight gain (total weight gain - placental and fetal weight)
NLEF	Number of leaves	Number of leaves found on a plant.
NNOD	Dry Mass/Plant Roots Not Nodulated	

GRO GROWTH EFFECT		
NODE	# Nodules/ nodulated Plant Roots	
PMTR	Perimeter	
RADI	Radius	A line segment extending from the center of a circle or sphere to the circumference or bounding surface.
RGNR	Limb/ Body Part Regeneration	Change in ability to regenerate a body part, byssus production.
RLGR	Relative Growth Rate	The size increase per unit interval of time.
SIZE	Size	The physical magnitude, extent, or bulk : relative or proportionate dimensions.
SPGR	Specific Growth Rate	Individual growth measurement calculated by using the net weight divided by time, also relative growth rate.
STNT	Stunting	
THIK	Thickness	Having or being of relatively great depth or extent from one surface to its opposite
THRV	Time to harvest	
WDTH	Width	Measurable change in width of test organism.
WGHT	Weight	Measurable change in weight of test organism.
WWGT	Wet Weight (AQUIRE Only)	Measurable change in the wet weight of an organism.
VGOR	Vigor	usually a combination of growth and injury effects
VOLU	Volume	The amount of space occupied by a three-dimensional object as measured in cubic units (as quarts or liters) : cubic capacity

MPH MORPHOLOGY EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ABNM	Abnormal	Use this effect-measurement combination when adult body structures are becoming abnormal.
ABST	Absence, absent	not present
AREA	Area	Area of an organ or response site

MPH MORPHOLOGY EFFECT		
BVSL	Blood vessels	Any of the tubular vessels conveying the blood (arteries, arterioles, capillaries, venules, and veins). (Gray's)
CAWT	Calcium weight	The ratio of calcium in the bone to the weight of the bone. A measure of bone density.
COSC	Caudal Ossification Center	
CRCM	Circumference	The external boundary or surface of a figure or object (www.m-w.com)
CTTK	Ratio of cortical thickness to diameter	The ratio of cortical thickness to the diameter
DEPO	Shell Deposition	Change in the ability to grow a shell.
DMTR	Diameter	The diameter of an organ or tissue
FSSR	Fissure	Any cleft or groove, normal or otherwise, especially a deep fold in the cerebral cortex which involves the entire thickness of the brain wall. (http://cancerweb.ncl.ac.uk/)
GMPH	General Morphological Changes	Used when more than one measurement is coded for an ACQUIRE record.
HGHT	Height	Measurable change in height of test organism. (existing SOP definition)
IMPS	Imposex, Intersex Conditions	
IPOS	Inter-parietal Ossification	The formation of bone or of a bony substance, the conversion of fibrous tissue or of cartilage into bone or a bony substance between the parietal bones or cartilages (Graylab on-line medical dictionary).
LGTH	Length	
MOSC	Metacarpal Ossification Center	
MSSG	Missing, absent	a tissue/organ not developed or missing from a body
NLRG	Enlargement	to increase in size
NORM	Normal	conforming to a type, standard, or regular pattern (www.m-w.com)

MPH MORPHOLOGY EFFECT		
OSSC	Ossification center	An area where the formation of bone or of a bony substance, the conversion of fibrous tissue or of cartilage into bone or a bony substance occurs. (http://cancerweb.ncl.ac.uk/omd/contents)
PULP	Pulp	The soft succulent portion of a fruit. (McGraw-Hill,1994)
POSC	Parietal Ossification	The formation of bone or of a bony substance, the conversion of fibrous tissue or of cartilage into bone or a bony substance located near the parietal bone (Graylab on-line medical dictionary).
RADI	Radius	A line segment extending from the center of a circle or sphere to the circumference or bounding surface. (from SOP)
RATO	Ratio	Ratio of the size of body parts.
RIBS	Number of ribs	Amount of rib bones present
SFRB	Supernumerary full rib	A full rib that exceed the expected number of ribs
SHPE	Change in Shape	
SIZE	Size	The size of an organ or tissue
SMIX	Somatic Index	Organ Weight in Relationship to Body Weight
SOSC	Sternal Ossification Center	
SRIB	Supernumerary Ribs	
SSRB	Short supernumerary rib	a partial rib that exceed the expected number of ribs
STBD	Seminiferous tubule diameter	The diameter of any of the coiled threadlike tubules that make up the bulk of the testis and are lined with a layer of epithelial cells from which the spermatozoa are produced.
STRC	Structural Changes	
STTO	Strength and Tone	
SVTE	Supernumerary vertebrae	Having more than the expected number of vertebrae.
TKWD	Thickness:width	Ratio of thickness to width

MPH MORPHOLOGY EFFECT		
VOLU	Volume	The amount of space occupied by a three-dimensional object as measured in cubic units (as quarts or liters) : cubic capacity
WGHT	Weight	The heaviness of an object.

CEL	CELLULAR GROUP
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CEL CELLULAR EFFECT		
Measurement Code	Measurement Name	Measurement Definition
AGGR	Aggregation/ Adhesion	
AREA	Area of the cell or cell mass	Area of the cell or cell mass
ARGY	Argyrophilic cells	An enteroendocrine cell
BASO	Basophil	A structure, cell or other histologic element staining readily with basic dyes; a granular leukocyte with an irregular shaped, relatively pale-staining nucleus that is partially constricted into 2 lobes; also called basophilic leukocytes; a beta cell of the adenohypophysis - see also gonadotroph and thyrotroph
BPCL	Bipolar Cell	A class of retinal interneurons, named after their morphology, that receive input from the photoreceptors and send it to the ganglion cells. (Gray's)
CCHG	Cell Changes	Cytology, change in organelle structure, cell size or cell volume (do not use GRO), phagocytosis. For algae, use for change in optical density, location of pigments, cell shape, size. Another example of where it might be appropriate to initiate use of a morph code. Used when more than one measurement is coded for an ACQUIRE record.
CDRT	Cell division rate	Cell division = The process by which living cells multiply; may be mitotic or amitotic. (McGraw-Hill, 1994)
CILR	Ciliated Type II Receptors	
CIRC	Choline acetyltransferase (ChAT) immunoreactive cells	Cell exhibiting an immunologic reaction to Choline acetyltransferase which is an enzyme that controls the production of acetylcholine (partial definition: cancerweb.ncl.ac.uk)
CLCE	Chloride Cell	

CEL CELLULAR EFFECT		
CRCM	Circumference	The external boundary or surface of a figure or object (www.m-w.com)
CTRV	Cell Turnover	
CYTO	Cytotoxicity	
DEND	Dendrite Receptors	
DIVC	Dividing Cells	
DMTR	Diameter	The diameter of a cell
DNSY	Density	
DPTH	Depth	The perpendicular measurement downward from a surface or the direct linear measurement from front to back. (www.m-w.com)
EOSN	Eosinophil	A structure, cell or histologic element readily stained by eosin, especially a granular leukocyte with a nucleus that usually has two lobes connected by chromatin.
ERTH	Erythoroblasts	Any type of nucleated erthrocyte, also desgating an immature cell from which a red corpuscle develops.
ESRS	Estradiol receptor sites	Cytoplasmic proteins that bind estradiol, migrate to the nucleus, and regulate DNA transcription. (Gray's)
GBLT	Goblet Cells	A unicellular, mucus-secreting intra-epithelial gland that is distended on the free surface. Also known as Chalice cell.
GLCL	Gland Cells	
GNDT	Gonadotrophs	The cells of the anterior pituitary that regulate reproduction are known as gonadotrophs and make the gonadotrophins- luteinising hormone and follicle-stimulating hormone (mumus.med.monash.edu.au)
GRAN	Granulocyte	Any cell containing granules, especially a leukocyte containing neutrophil, basophil, or eosinophil granules in its cytoplasm
HGHT	Height	The height of a cell
HMPS	Hematopoiesis	The formation and development of blood cells involving both proliferation and differentiation from stem cells. In adult mammals usually occurs in bone marrow. (Gray's)
HTCY	Heterocyst frequency	Specialized cell type found at regular intervals along the filaments of certain Cyanobacteria, site of nitrogen fixation.
LEUK	Leukocytes	White blood cell

CEL CELLULAR EFFECT		
LMFI	Lamellar fusion index	An index related to the fusion of the lamellae which is an area of the gills where exchange of gasses / waste products takes place.(partial definition http://www.aquatext.com/list-l.htm#Lamellae)
LMPH	Lymphocyte	Any of the mononuclear , nonphagocytic leukocytes found in the blood, lymph and lymphoid tissues.
MONO	Monocyte	A large, agranulated leukocyte with a relatively small, eccentric, oval or kidney-shaped nucleus.
MYLO	Myelocyte	time a motile cell produced by and found in the bone marrow which develops into granular leukocytes. (Gray's)
NCCM	Normochromatic cells, micronucleated	Being normal in color; referring especially to red blood cells that possess the normal quantity of hemoglobin.
NCEL	Number/Frequency of Cells	
NEUT	Neutrophil	A large granular leukocyte with a highly variable nucleus, consisting of three to five lobes, and cytoplasmic granules which stain with neutral dyes and eosin.
NLEI	Nuclei	The major organelle of eukaryotic cells, in which the chromosomes are separated from the cytoplasm by the nuclear envelope. (http://cancerweb.ncl.ac.uk/)
NRBC	Nucleated red blood cells	Nucleated red blood cells, (nrbc or normoblasts), represent the stages of a red blood cell before it matures. Cells of this stage are usually seen in newborn infants, and in patients with responses to hemolytic crises, such as in megaloblastic anemia and iron deficiency anemia. The average size of the normoblast is 7-12 µm in diameter. The cytoplasm is pink. The nucleus is pyknotic (a homogeneous blue-black mass with no structure). (http://www.wadsworth.org/chemheme/heme/microscope/nrbc.htm)
NROD	Rods	Elongated cells or elements of the sensory layer of the retina, some of which are cylindrical, others somewhat conical. (Gray's)
OGNL	Organelle	A specialized subcellular structure, such as a mitochondrion, having a special function.
OSRS	Osmotic Resistance/RBC	
PCCM	Polychromatic cells, micronucleated	A primitive erythrocyte in bone marrow, with basophilic material as well as hemoglobin (acidophilic) in the cytoplasm. Synonym: polychromatophil cell.

CEL CELLULAR EFFECT		
PCRC	Polychromatic cells	A primitive erythrocyte in bone marrow, with basophilic material as well as hemoglobin (acidophilic) in the cytoplasm. Synonym: polychromatophil cell.
PKNJ	Purkinje cells	Largest brain neuron involved synaptic processing (www.omnimag.com/live_science/purkwrlld)
PKNS	Pyknosis	Contraction of nuclear contents to a deep staining irregular mass, sign of cell death. (http://cancerweb.ncl.ac.uk)
PLAS	Plasmolysis	Contraction or shrinking of the protoplasm of a plant cell due to the loss of water by osmotic action
PRKY	Perikarya, perikaryon	Cell body surrounding nucleus of a neuron does not include axonal and dendritic processes (Gray's)
RBCE	Red Blood Cell	Erythrocyte - found in peripheral blood
RETI	Reticulocytes	A young red blood cell showing a basophilic reticulum under vital staining
RSBC	Receptor site, binding capacity	
SGDN	Signal Density	
SIZE	Size	The physical magnitude, extent, or bulk : relative or proportionate dimensions of a cell
SPLO	Splenocytes	The monocyte characteristic of the spleen
SRTL	Sertoli cells	Elongated cells in the tubules of the testis to which the spermatids become attached. They provide support, protection, and, apparently, nutrition until the spermatids become transformed into mature spermatozoa. (http://cancerweb.ncl.ac.uk/)
STCL	Stippled cells	Cells that have an appearance of being engraved by means of dots and flicks (partial definition: www.m-w.com)
STRC	Structural Changes	
THRM	Thrombocytes	A blood platelet
TWBC	White Blood Cell Count, Total	Measure of total WBC
UBWB	White Blood Cell, Undifferentiated Blasts	Absence of normal differentiation of white blood cell blasts

CEL CELLULAR EFFECT		
VOLU	Volume	The amount of space occupied by a three-dimensional object as measured in cubic units (as quarts or liters) : cubic capacity (from SOP)
WDTH	Width of the cell	Width of the cell

GEN GENETIC EFFECT		
Measurement Code	Measurement Name	Measurement Definition
2KMR	Cyp2K mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Cyp2K
ACMR	beta-Actin mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins. Beta-Actin is a muscle protein that is the chief constituent of the Z-band myofilaments of each sarcomere.
ALFR	Allele frequency	the frequency of any one of a series of two or more different genes that occupy the same position (locus) on a chromosome. (cancerweb.ncl.ac.uk)
AMRN	Cytochrome P450aromB mRNA	Cytochrome P450 aromatase messenger RNA. Part of an enzyme which converts androgens to oestrogens by desaturating ring a of the steroid. mRNA (messenger RNA) is the mediating template between DNA and proteins. P450arom is a major player in estrogen signaling. Also known as Cytochrome P450 aromatase mRNA and Estrogen synthetase mRNA
APOP	Apoptosis, Programmed Cell Death, DNA Fragmentation	
BADF	beta-Actin cDNA fragments	cDNA is DNA that is synthesised from a messenger RNA template, the single-stranded form is often used as a probe in physical mapping to locate the gene or can be cloned in the double stranded form. In this case specific to the protein beta-actin. (http://cancerweb.ncl.ac.uk)
BRAK	Chromosomal breaks	Chromosome breakage - A type of chromosomal aberration which may result from spontaneous or induced breakage. Alkylating agents, various types of irradiation, and chemical mutagens have been found to cause induced chromosomal breakage. Breakage can induce base pair translocations, deletions, or chromatid breakage
CA1M	CYP1A1 mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Cyp1A1

GEN GENETIC EFFECT		
CA3M	CYP1A3 mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Cyp1A3
CABR	Chromosomal aberrations	Modification of the normal chromosome complement due to deletion, duplication, or rearrangement of genetic material.
CGAP	Chromosomal gap	A localised area of thinning in a chromatid which may simulate a complete break. (Gray's)
CHDF	Choriogenin H cDNA fragments	cDNA is DNA that is synthesised from a messenger RNA template, the single-stranded form is often used as a probe in physical mapping to locate the gene or can be cloned in the double stranded form. In this case specific to the protein Choriogenin H. (http://cancerweb.ncl.ac.uk)
CHLM	Chlorophyll Mutation/Albino Mutants	Mutation: a change in form, quality or some other characteristic; in genetics - a permanent transmissible change in the genetic material
CHMR	Choriogenin H mRNA	Choriogenin H is the high molecular weight liver derived precursor protein (ZI-1,2) of the inner layer subunits of the egg envelope. mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Choriogenin H. (ECOREF#64021)
CLDF	Choriogenin L cDNA fragments	cDNA is DNA that is synthesised from a messenger RNA template, the single-stranded form is often used as a probe in physical mapping to locate the gene or can be cloned in the double stranded form. In this case specific to the protein Choriogenin L. (http://cancerweb.ncl.ac.uk)
CLMR	Choriogenin L mRNA	Choriogenin L is the low molecular weight liver derived precursor protein (ZI-3) of the inner layer subunits of the egg envelope. mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Choriogenin L. (ECOREF#64021)
CPRN	Cytochrome P1A Messenger RNA (Cyp1A mRNA)	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Cyp1A
DAMG	Damage	
DNAB	DNA binding	DNA binding to chemical
DNAC	DNA Concentration	
DNAD	DNA Adducts	Adducts are damaged cellular machinery when compounds bind irreversibly with DNA, proteins or other cellular components (www.vetmed.ucdavis.edu)

GEN GENETIC EFFECT		
DNAS	DNA Synthesis Rate	The linking together of nucleotides (as deoxyribonucleotide triphosphates) to form DNA. In vivo, most synthesis is DNA replication, but incorporation of precursors also occurs in repair. In the special case of retroviruses, DNA synthesis is directed by an RNA template (see reverse transcriptase). H3 thymidine incorporation - Thymidine, an essential DNA building block can be radioactively labeled with H3 (tritium) and used to measure DNA synthesis as a reflection of cell division.
DNPR	DNA to protein ratio	a ratio of DNA to protein
DNRN	Ratio of DNA to RNA	The ratio between DNA and RNA concentrations in a sample
DPLT	Diplotene	a stage of meiotic prophase which follows the pachytene and during which the paired homologous chromosomes begin to separate and chiasmata become visible (Webster's)
EMRN	Estrogen mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins. Estrogen - Any of various natural or synthetic substances possessing the biological activity of estrus-producing hormones.
EMRR	Estrogen receptor : Estrogen mRNA ratio	The ratio of estrogen receptor to estrogen receptor messengerRNA
ESRG	Estrogen receptor gene	The estrogen-activated receptor binds to its responsive element in the 5' flanking region of estrogen-responsive genes and modulates the transcription of these genes through its interactions with others transcription factors and the components if the transcription initiation complex. (ECOREF#60619)
FSMR	Follicle stimulating hormone beta mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to follicle stimulating hormone
G1PN	G1 Phase Nuclei	
GEXP	Gene Expression	
GGEN	Genetics, General	Changes in the genetic processes of cell (e.g. RNA, DNA).
GHMR	Growth hormone mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins. Growth hormone is a polypeptide hormone secreted by the anterior pituitary which promotes an increase in body size. Any hormone that regulates growth in plants and animals.
GTPF	Genotype Frequencies	

GEN GENETIC EFFECT		
HTZY	Heterozygosity	The presence of different alleles at one or more loci on homologous chromosomes.
LEPT	Leptotene	a stage of meiotic prophase immediately preceding synapsis in which the chromosomes appear as fine discrete threads
LHMR	Lutenizing hormone mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins, in this case specific to Lutenizing hormone
LPDN	Lipid to DNA ratio	The amount of lipid as compared to the amount of DNA in a sample
ME1A	Meiotic Abnormalities, 1 st Anaphase	
ME1M	Meiotic Abnormalities, 1 st Metaphase	
ME2A	Meiotic Abnormalities, 2 nd Anaphase	
ME2M	Meiotic Abnormalities, 2 nd Metaphase	
MEDM	Meiotic Abnormalities, Diakinesis and 1 st Metaphase	
MEIA	Meiotic Abnormalities, General	
MEIR	Meiosis Rate	
MIAT	Mitotic Abnormalities, Ana-telophase	
MIBC	Mitotic Abnormalities, Binucleate Cell	
MIBG	Mitotic Abnormalities, Bridge	

GEN GENETIC EFFECT		
MICL	Mitotic Abnormalities, Clumping	
MICY	Mitotic Abnormalities, Cytomixis	
MIES	Mitotic Abnormalities, Early Separation	
MIEX	Mitotic Abnormalities, Exclusion	
MIFR	Mitotic Abnormalities, Fragment	
MIIN	Mitotic Abnormalities, Interphase Cells	
MILG	Mitotic Abnormalities, Laggard	
MIMN	Mitotic Abnormalities, Micronuclei	
MIMT	Mitotic Abnormalities, Metaphase	
MINB	Mitotic Abnormalities, Nuclear Budding	
MINF	Mitotic Abnormalities, Nuclear Fusion	
MIPO	Mitotic Abnormalities, Disturbed Polarity	

GEN GENETIC EFFECT		
MIPR	Mitotic Abnormalities, Prophase	
MISK	Mitotic Abnormalities, Stickiness	
MITA	Mitotic Abnormalities, General	
MITI	Mitotic Index (#Mitoses/Total Cells)	
MITR	Mitotic Rate	
MRMT	Metallothionein mRNA metallothionein ratio	The ratio of metallothionein messengerRNA to metallothionein
MRNA	Messenger RNA	mRNA (messenger RNA) is the mediating template between DNA and proteins.
MMRN	Metallothionein mRNA	
MNUC	Micronuclei Increase	
MTOS	Mitosis	A method of indirect division of a cell, consisting of a complex of various processes, by means of which the two daughter nuclei normally receive identical complements of the number of chromosomes characteristic of the somatic cells of the species. Mitosis, the process by which the body grows and replaces cells, is divided into four phases. (http://cancerweb.ncl.ac.uk)
MUTA	Mutation	Mutation: a change in form, quality or some other characteristic; in genetics - a permanent transmissible change in the genetic material
NABN	Nuclear Abnormalities	
NCPF	Nuclear phase frequency	Number of phases that a cell goes through during cell division

GEN GENETIC EFFECT		
PACH	Pachytene	the stage of meiotic prophase that immediately follows the zygotene and that is characterized by paired chromosomes thickened and visibly divided into chromatids and by the occurrence of crossing-over
PLMR	Prolactin mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins. Prolactin is a protein hormone produced by the adenohypophysis; stimulates lactation and promotes functional activity of the corpus luteum
POLY	Chromosomal Polyploidy	Polyploidy: the state of having more than two full sets of homologous chromosomes
PRDN	Protein to DNA ratio	The amount of protein as compared to the amount of DNA in a sample
PSMR	Pituitary specific transcription factor mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins.
RASO	Ras Oncogene mutation	A gene that causes cancer in an animal. The gene specifies the structure of an enzyme that catalyzes events that can induce cancerous growth. (McGraw-Hill,1994.) Ras is a protein found in chromosomes and when mutated it is permanently switched on telling the cell to grow regardless of whether the receptors on the cell surface are activated or not.
RNAC	RNA Concentration	
RNAS	RNA Synthesis Rate	
RNDN	RNA to DNA Ratio	
RNPR	RNA to protein ratio	a ratio of RNA to protein
SEXE	Sex Expression Change	
TSLE	Translocation Efficiency	
VDNA	Vitellogenin cDNA	cDNA is DNA that is synthesised from a messenger RNA template, the single-stranded form is often used as a probe in physical mapping to locate the gene or can be cloned in the double stranded form. In this case specific to the protein vitellogenin. (http://cancerweb.ncl.ac.uk)
VMRN	Vitellogenin Messenger RNA	

GEN GENETIC EFFECT		
WTDN	Weight to DNA ratio	The weight of a sample as compared to the amount of DNA in a sample
ZRMR	Zona radiata mRNA	mRNA (messenger RNA) is the mediating template between DNA and proteins.
ZYGO	Zygotene	the stage of meiotic prophase which immediately follows the leptotene and during which synapsis of homologous chromosomes occurs

HIS HISTOLOGY EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ACAP	Arterial Cuff Atrophy	Arterial - pertaining to an artery or to the arteries. (Dorlands) Cuff - A small bandlike structure encircling a part. (Dorlands) Atrophy - a wasting away; a diminution in the size of a cell, tissue, or organ (Dorlands).
ALYS	Autolysis	Self-digestion by body cells following somatic or organ death or ischemic injury.
ANSK	Anisokaryosis	Inequality in the size of the nuclei of cells (Dorlands).
ARTS	Arteriosclerosis	A degenerative arterial disease marked by hardening and thickening of the vessel walls.
ASCT	Ascites	Accumulation of serous fluid in the spaces between tissues and organs in the cavity of the abdomen (Webster's).
ASLT	Alpha Islets	Alpha cell, pancreatic: A type of cell in the pancreas, within the pancreas, the alpha cells are located in areas called the islets of Langerhans. Alpha cells make and release glucagon which raises the level of glucose (sugar) in the blood.
ATRS	Atresia	Imperforation or closure of a natural orifice or passage of the body.
ATPH	Atrophy	Diminution in the size of a cell, tissue, or organ that was once fully developed of normal size.
BODS	Bodies	a mass of matter distinct from other masses (Webster's)
BSLT	Beta Islets	Beta cell, pancreatic: A type of cell in the pancreas. Within the pancreas, the beta cells are located in areas called the islets of Langerhans. They constitute the predominant type of cell in the islets. The beta cells are important because they make insulin. Degeneration of the beta cells is the main cause of type I (insulin-dependent) diabetes mellitus.

HIS HISTOLOGY EFFECT		
CLFL	Collapsed Follicles	Follicle - A sac or pouchlike depression or cavity. (Dorlands)
CLLD	Colloids	Microscopic particles between one nanometer and one micrometer in size and can be macromolecules. (Gray's)
CLPG	Clumping Pigment Granules	
CRYT	Crystals	Formations of small irregular solid material often composed of calcium, uric acid and phosphate. (http://cancerweb.ncl.ac.uk)
CSTD	Cestodiasis	Tapeworm infestation, infestation with cestodes, a group of flattened and tapelike hermaphroditic worms that are intestinal parasites in humans and other animals, producing larvae that may invade body tissues.
CSTS	Cyst	Any closed cavity or sac that is lined by epithelium often contains liquid or semi-solid material. (Gray's)
CTRT	Cataracts	A clouding of the lens of the eye or of its surrounding transparent membrane that obstructs the passage of light. http://www.m-w.com/cgi-bin/dictionary
CTYP	Percent Cell Type	
CYIN	Cytoplasmic Inclusions	A foreign substance, either liquid or solid, usually of minute size, inclosed in the mass of a the cytoplasm (Graylab on-line medical dictionary)
CYTM	Cytomegaly	enlargement of both the cytoplasm and nucleus while maintaining a normal N/C ratio (www.csi-net.net/suzanne/page22.htm)
CYTP	Cytoplasm	the organized complex of inorganic and organic substances external to the nuclear membrane of a cell and including the cytosol and membrane-bound organelles (as mitochondria or chloroplasts) (Webster's)
CYVC	Cytoplasmic Vacuoles	Spaces or cavities within the cytoplasm.
DBRS	Debris	an accumulation of fragments (Webster's)
DEGN	Degeneration	Deterioration of cellular integrity with no sign of response to injury or disease.
DISO	Cellular Disorganization	
DLAT	Dilation	The process of enlargement or expansion. (http://cancerweb.ncl.ac.uk)

HIS HISTOLOGY EFFECT		
EDMA	Edema	An excessive accumulation of fluid in the cells, tissue spaces, or body cavities due to a disturbance in the fluid exchange mechanism.
EHYP	Erythroid Hyperplasia	The abnormal multiplication or increase in the number of normal cells in normal arrangement in the erythroid (Graylab on-line medical dictionary).
ENCP	Encephalopathy	Any degenerative disease of the brain.(http://cancerweb.ncl.ac.uk/omd/contents)
ENDR	Endarteritis	Inflammation of the inner lining of an artery.
ESPH	Esophagitis	Inflammation of the esophagus.
EXCS	Extracellular space	Interstitial space between cells, occupied by fluid as well as amorphous and fibrous substances.(http://cancerweb.ncl.ac.uk/omd/contents)
FBRs	Fibrosis	A condition marked by increase of interstitial fibrous tissue (MW online).
FUSE	Fuse, fused	to become blended or joined by or as if by melting together (Webster's)
GHIS	Histological Changes, General	Presence of physical damage or change to tissues or cells (for example, lesions, neoplasms); gross histological effects such as whole plant injury; disintegration of roots, stems or leaves; root fragmentation. For animals such effects include cell sloughing. The specifics of the histology effect will be reported in EE_Remarks for AQUIRE or the Result Remarks for TERRETOX. Used when more than one measurement is coded for an ECOTOX record.
GLSN	Gross Lesions	
HEMR	Hemorrhage	Change or presence of hemorrhaging.
HFLX	Hyperflexion	Flexion of a limb or part beyond the normal limit. Synonym: superflexion.
HRNA	Hernia	The protrusion of a loop or knuckle of an organ or tissue through an abnormal opening. (Gray's)
HYCE	Hypocellularity	
HYCR	Hyperchromicity	An increase in the optical density of a solution with nucleic acids in it such that it is able to absorb more ultraviolet radiation, which occurs when the double-stranded nucleic acid molecules denature into single-stranded molecules (Graylab on-line medical dictionary).

HIS HISTOLOGY EFFECT		
HYDS	Hydropic Swelling	
HYPL	Hyperplasia	Increase in cell number causing an increase in in the size of a tissue or organ.
HYPT	Hypertrophy	Increase in cell size causing an increase in the size of an organ or tissue.
IHGT	Increased Height	Increase in height of an object such a cells or cellular components.
IMVL	Increased Medullary Volume	Medullary - pertaining to the marrow or to any medulla. Medulla - The inmost part. A general term for the most interior portion of an organ or structure. Called also marrow. (Dorlands)
ININ	Intranuclear inclusions	a foreign substance, either liquid or solid, usually of minute size, inclosed within the nucleus of a cell
IPDY	Increased Portal Density	Portal: Of or pertaining to a porta, especially the porta of the liver; as, the portal vein, which enters the liver at the porta, and divides into capillaries after the manner of an artery. (http://www.graylab.ac.uk/cgi-bin/omd?portal)
IPHM	Increased Perivenous Homogeneity	Perivenous - around the vein. (Dorlands)
LESI	Lesions	A structural or functional alteration due to injury or disease.
LMLL	Lamellae, Lamella	A thin, plate-like layer, the layer between the walls of two adjacent plant cells. (Gray's)
LPHD	Lymphoid depletion	Loss of structure found within the lymphatic system that consists of lymphocytes within a network of fibers. (http://cancerweb.ncl.ac.uk)
MALN	Misalign, misaligned	Not to be in or come into precise adjustment or correct relative position (Webster's)
MAPH	Microphthalmia and anophthalmia	An unnatural smallness of the eyes, occurring as the result of disease or of imperfect development or congenital absence of all tissues of the eyes. (Gray's)
MELM	Melanomacrophages	
MHYP	Myeloid Hyperplasia	The abnormal multiplication or increase in the number of normal cells in normal arrangement in myeloid (Graylab on-line medical dictionary)
MYOP	Myopathy	disorder of muscle tissue or muscles
NCRL	Necrotic Lesions	
NCRO	Necrosis	Death of a cell or group of cells as a result of injury, disease, or other pathologic state.

HIS HISTOLOGY EFFECT		
NCVS	Nuclear Vesiculation	Vesiculation -the prescence or formation of vesicles. (Dorlands) Nuclear - Of or pertaining to a nucleus; as, the nuclear spindle or the nuclear fibrils of a cell; the nuclear part of a comet, etc (http://www.graylab.ac.uk/cgi-bin/omd?nuclear).
NPHG	Nephrogenesis	development or growth of the kidney.
NPHR	Nephrosis	Degenerative or retrogressive renal lesions, distinct from inflammation (nephritis) or vascular involvement (nephrosclerosis), especially as applied to tubular lesions.
PNCH	Parenchyma	The essential elements of an organ, used in anatomical nomenclature as a general term to designate the functional elements of an organ, as distinguished from its framework or stroma. Also known as parenchymal cells. (cancerweb.ncl.ac.uk)
PRLF	Proliferation	
PRVN	Proventriculitis	Inflammation of the glandular first portion of the stomach of birds, in which food from the crop (crop, avian) is mixed with peptic enzymes and passed to the gizzard.
RCVL	Reduced Corticle Volume	Decrease in corticle volume.
RFSZ	Reduced Follicle Size	Decrease in follicle size.
RPCD	Reduced Periarteriolar Lymphocyte Sheath Cell Density	As an arteriole leaves a septum and enters the interior volume of the spleen it immediately acquires a continuous coating of lymphocytes. This "sleeve" of lymphocytes is the periarteriolar lymphocyte sheath, or PALS. (http://education.vetmed.vt.edu/Curriculum/VM8054/Labs/Lab13/Lab13.htm)
SCNG	Sinus Congestion	Blockage of one or more of the four pairs of sinus passageways in the skull. Blockage may result from inflammation and swelling of the nasal tissues, obstruction by one of the small bones of the nose (deviated septum) or from secretion of mucus (http://www.healthwell.com/healthnotes/Concern/Sinus_Congestion.cf m).
SHMT	Sinus Haematopoiesis	The formation and development of blood cells involving both proliferation and differentiation from stem cells in the sinus (Graylab on-line medical dictionary)
SHYP	Sinus Hyperplasia	The abnormal multiplication or increase in the number of normal cells in normal arrangement in the sinus (Graylab on-line medical dictionary)

HIS HISTOLOGY EFFECT		
SMLN	Severe misalignment	Not to be in or come into precise adjustment or correct relative position (Webster's)
SMMN	Slight to moderate misalignment	Not to be in or come into precise adjustment or correct relative position (Webster's)
SNAP	Synapses	the point at which a nervous impulse passes from one neuron to another (Webster's)
SOSS	Surpernumerary ossification	beyond the normal number of ossifications
SWEL	Swelling, Swollen	
TFLR	Tissue Damage Measured by Fluorescence under Dyes or in Uv Light	
USTR	Ultrastructural Changes	
VCLZ	Vacuolization	The process of forming vacuoles; the condition of being vacuolated.
XCPH	Exencephaly	Condition in which the skull is defective with the brain exposed or extruding. Synonym: exencephalia. (Gray's)

MOR MORTALITY OR SURVIVORSHIP ² GROUP		
MOR MORTALITY EFFECT		
Measurement Code	Measurement Name	Measurement Definition
BDAY	Bird days	This is a measure of survivorship. Bird days is equal to the number of birds alive on day X * X days. (36364)
DLMT	Dominant lethal mutations	(1-live embryos per test female/live embryos per control female) X 100
DTTM	Death with tumors	Mortalities that occurred with tumors
EBCN	Effective Body Concentration	The body residue of a chemical that is associated with an effect.

MOR MORTALITY EFFECT		
GMOR	Mortality/Survival, General	Used when more than one measurement is coded for an AQUIRE record. (General mortality is a place holder for AQUIRE transfers)
HTCH	Hatch	Change in percent hatch, time to hatch or number of eggs hatched.
LBCN	Lethal Body Concentration	Also Lethal Body Burden. The body residue of a chemical that is associated with mortality. <i>Use this effect-measurement pair if the author reports an endpoint based on lethal body burden or lethal body concentration (internal chemical concentrations).</i>
LIFE	Life Expectancy	
LFSP	Lifespan or longevity	
MDTH	Mean Time of Death	
MORT	Mortality	Effect expressed as % death or % survival. A lethal effect may describe mortality (MOR) or an observed behavior that indicates mortality (e.g., shell valve closures for bivalves (SVC), immobilization (IMM) for invertebrates, or detachment (DET) for sessile organisms). "MOR" differs from "ABD" in that an initial number of organisms is known for the mortality effect and results are expressed in terms of the initial number (e.g., percent survival). If the author defines criteria used to determine that the organism was dead, and then identifies the effect as a lethal effect, "MOR" will be coded in the EFFECT field. MOR may be coded as an effect with either LC, EC, LD, NOEC, or LOEC endpoints.
PSUR	Probability of Survival	Survival probability, $g(x)$, describes the probability of survival from age x to age $x+1$, given that an individual has already survived to age x . To calculate $g(x)$, divide the survivorship schedule at age $x+1:l(x+1)$ by the survivorship schedule at age
SURV	Survival	
SVVS	Survivorship	Number alive at beginning of an age class from original cohort
TDTH	Time to Death	
TKNO	Knockdown	
TLET	Time to 100% Mortality	

PHY	PHYSIOLOGICAL GROUP
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IMM IMMUNITY EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ABDT	Antibody Titres	
ABSC	Abscess	A localized pus-forming (suppurative) bacterial infection. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?abdominal+abscess)
ASHG	Anti-sheep Red Blood Cell Hemagglutinin	
CMGR	Cell migration	Implies movement of a population of cells from one place to another as in the movement of neural crest cells during morphogenesis
DHYP	Delayed Type Hypersensitivity	
GIMM	Immunity, General	Used when more than one measurement is coded for an ACQUIRE record.
HEAL	Healing	To make sound or whole [heal a wound]
HMRL	Humoral immunity	immune responses moderated by antibodies (grayline)
HTPL	Heterophiles	An antibody raised against an antigen from one species that also reacts against antigens from other species.
IFCT	Infected	Contaminated with a disease-producing substance or agent (Webster's)
IGMG	Immunoglobulin G	The classical immunoglobulin class also called 7S IgG (150 kD). Composed of two identical light and two identical heavy chains, the constant region sequence of the heavy chains being of the type. The molecule can be described in another way as being composed of two Fab and an Fc fragment. (cancerweb.ncl.ac.uk)
IGMM	Immunoglobulin M	An immunoglobulin M molecule (970 kD) is built up from five immunoglobulin G type monomers joined together, with the assistance of J chains, to form a cyclic pentamer. Immunoglobulin M binds complement and a single molecule bound to a cell surface can lyse that cell. Immunoglobulin M is usually produced first in an immune response before immunoglobulin G. (cancerweb.ncl.ac.uk)
INTS	Intussusception	Intussusception refers to a telescoping of one portion of the intestine into another. This results in reduced blood supply to the affected portion of the intestine. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?intussusception)

IMM IMMUNITY EFFECT		
LKMA	Leukemia	An acute or chronic disease of unknown cause in man and other warm blooded animals that involves the blood forming organs, is characterised by an abnormal increase in the number of leucocytes in the tissues of the body with or without a corresponding
LYPA	Lymphoma	Malignant tumour of lymphoblasts derived from B lymphocytes. (http://cancerweb.ncl.ac.uk)
LYMP	Lymphocyte Activity	
MCPG	Macrophage activity	Relatively long lived phagocytic cell of mammalian tissues, derived from blood monocyte. Macrophages from different sites have distinctly different properties. In response to foreign materials they may become stimulated or activated. Macrophages play an important role in killing of some bacteria, protozoa and tumor cells. They release substances that stimulate other cells of the immune system and are involved in antigen presentation. (http://cancerweb.ncl.ac.uk)
MPHG	Microphage Function, Activity	
MYEL	Myelosis	A condition characterized by abnormal proliferation of tissue or cellular elements (http://cancerweb.ncl.ac.uk/cgi-bin/omd?myelosis)
NKCA	Natural Killer Cell Activity	
PARA	Amount or Percent Organisms Infested with Parasites	
PFCR	Plaque forming cell response	Plaque forming cell = An antibody-producing cell detected in vitro by its ability to lyse antigen-sensitized erythrocytes in the presence of complement. http://www.fleshandbones.com/immunology/roitt/glossary.cfm?letter=P
PHAG	Phagocytosis	A specialized form of macropinocytosis in which cells engulf large solid objects such as bacteria and deliver the internalized objects to special digesting vacuoles.
PNMA	Pneumonia	Inflammation of the lungs with consolidation. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?pneumonia)
PRNF	Parasitic Infection	
PRTU	Proteuria	the presence of an excess of serum proteins in the urine; called also albuminuria (Dorland's On-Line) (also known as proteinuria)

IMM IMMUNITY EFFECT		
RSTT	Rosette Response, Rosette Forming Cell Concentration	
THYM	Thymocyte Activity	
INJ INJURY EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ABSN	Abrasion	A superficial injury to the skin or other body tissue caused by rubbing or scraping resulting in an area of body surface denuded of skin or mucous membrane
ADNM	Adenoma	A benign epithelial tumour in which the cells form recognizable glandular structures or in which the cells are clearly derived from glandular epithelium. (Gray's)
AMLD	Amyloidosis	Deposition of amyloid. A common complication of several diseases (leprosy, tuberculosis), often associated with perturbation of the immune system, although there may be immunosuppression or enhancement. (http://cancerweb.ncl.ac.uk/)
AUTO	Autotomy	Constriction and/or loss of segments (ECOREF#47717). The act of casting off a body part as a means of escape (http://cancerweb.ncl.ac.uk/)
BTMR	Benign tumor	A nonmalignant clone of neoplastic cells that does not invade locally or spread to other parts of the body (metastasize), having lost growth control but not positional control. Usually surrounded by a fibrous capsule of compressed tissue. (Gray's)
CLRS	Chlorosis	A form of macrocytic anemia in young females characterized by marked reduction in hemoglobin and a greenish skin color. A disease condition of green plants seen as yellowing of green parts of the plant.
CURV	Curvature	
DAMG	Damage	
DESI	Desiccation	The permanent decrease or disappearance of water.
GINJ	Injury, General	Used when more than one measurement is coded for an ACQUIRE record.
IFLM	Inflammation	A localized protective response elicited by injury or destruction of tissues, which serves to destroy, dilute or wall off (sequester) both the injurious agent and the injured tissue. (http://cancerweb.ncl.ac.uk/)

INJ INJURY EFFECT		
MTMR	Malignant tumor	A tumor that tends to become progressively worse and to result in death. Having the properties of anaplasia, invasion and metastasis.
MUTI	Mutigenesis	the occurrence or induction of mutation
PLYP	Polyp	a projecting mass of swollen and hypertrophied or tumorous membrane
SYMP	Symptom Severity Index	
THMB	Thrombosis	Aggregations of blood factors, primary platelets and fibrin with entrapment of cellular elements, frequently causing vascular obstruction at the point of its formation.
TUMR	Tumor Induction	
ULCR	Ulcer	A local defect or excavation, of the surface of an organ or tissue, which is produced by the sloughing of inflammatory necrotic tissue
VASC	Vascular Disruption	
WART	Papilloma, wart	Wart, benign tumor of the epithelium
ITX INTOXIFICATION EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ANOR	Anorexia	Loss of appetite .
ATAX	Ataxia	Lack of muscular coordination due to any of several nervous system diseases.
CONV	Convulsions	An episode of involuntary, generally violent muscular contractions.
GITX	Intoxication, General	Used when more than one measurement is coded for an ACQUIRE record.
IMBL	Immobile	Change in the failure to respond or lack of movement after mechanical stimulation.
INCO	Incoordination	
MBLT	Mobility	
PARL	Paralysis	Complete or partial loss of motor or sensory function.
TINT	Time to Signs of Intoxication	

PHY PHYSIOLOGICAL EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ABSC	Abscission	A physiological process promoted by abscisic acid whereby plants shed a part, such as a leaf, flower, seed, or fruit.
APCT	Aerobic Protein Catabolism	
ADPE	Adsorption Efficiency	
ADPO	Oxidative Phosphorylation	Conversion of inorganic phosphate to the energy-rich phosphate of adenosinetriphosphatase by reactions associated with the electron transfer system.
AECG	Abnormal ECG	electrocardiogram (ECG / EKG) is an electrical recording of the heart
AECH	Adenylate energy charges (AEC)	The Adenylate energy charge (AEC) accounts for the regulation of enzymatic activity by ATP, ADP and/or AMP. (digital.library.okstate.edu/oas/oas_pdf/v74/p31_36.pdf)
AEXR	Ammonia Excretion	
AHIN	A-H Intervals	The time from the initial rapid deflection of the atrial wave to the initial rapid deflection of the His bundle (H) potential; it approximates the conduction time through the A-V node (normally 50-120 msec). (http://cancerweb.ncl.ac.uk/)
ALAE	Aminolevulinic acid excretion	Aminolevulinic acid excreted by organism
ANBC	Aniline Binding Capability	
ASML	Assimilation Efficiency	Change in efficiency of trophic transfers between different levels in the food chain, e.g. between primary producers and grazers.
ATFL	Aortic flow	The amount of blood flowing through the aorta.
AVCD	AtrioVentricular conduction delay	Delays in conduction below the bifurcation of Bundle of His cause bundle branch or fascicular blocks, while atrioventricular conduction is maintained, unless all three fascicles are simultaneously affected. The causes are both intrinsic and extrinsic. However, since the AV node and bundle of His provide a special connection of the atria to the ventricles, focal injury from heart attacks, infections, catheter trauma, is common.

PHY PHYSIOLOGICAL EFFECT		
AXSS	Axis shift	Related to the mean electrical axis of an EKG. The mean electrical axis of the QRS complex is the average of the total depolarization of the ventricles in the frontal plane. There is a correlation between the mean electrical axis of the QRS complex and the electrical activity of the heart. Therefore, in pathologic hypertrophy of either ventricle (ie. when there is more muscle being depolarized), the axis tends to shift in the direction of the hypertrophied ventricle.
BAAT	rBAT induced amino acid transfer	The transport of amino acids via the rBAT induced system involves an electrogenic exchange of neutral and dibasic amino acids. rBAT is a protein that is located in the brush border membranes of intestine and renal proximal tubule cells. (ECOREF#45834
BDVL	Blood Volume	
BLPR	Blood pressure	pressure that is exerted by the blood upon the walls of the blood vessels and especially arteries and that varies with the muscular efficiency of the heart, the blood volume and viscosity, the age and health of the individual, and the state of the vascular wall.
BLUM	Bioluminescence	The emission of visible light by living organisms.
BNDS	Bending strength	A measure of the load an object can bear if its ends are supported and a weight is attached to the middle, i.e. it is how many pounds of lateral force the object takes before it breaks.
BTFT	Butter fat	The natural fat of milk and chief constituent of butter consisting essentially of a mixture of glycerides (as those derived from butyric, capric, caproic, and caprylic acids) (www.m-w.com)
BTMP	Body Temperature	
C14U	C-14 Uptake	Amount or process of Carbon-14 uptake by a cell
CAAS	Calcium assimilation	amount of calcium assimilated
CAEX	Calcium excretion	Calcium excreted by organism
CANU	Calcium not excreted	Calcium utilized/Calcium ingested * 100
CARE	Calcium retained	Calcium retained/Calcium ingested * 100
CARU	Calcium retention to utilization ratio	Ratio of Calcium retained (Utilized - Transferred to Egg) to Calcium utilized (ingest - excreted)
CASS	Carbon assimilation	Assimilation of carbon into an organism or tissue.

PHY PHYSIOLOGICAL EFFECT		
CATR	Calcium transfer	Per cent of calcium transferred to the egg, Calcium in egg/Calcium utilized x 100
CATU	Calcium transfer to utilization ratio	Per cent of calcium transferred to the egg in relation to calcium utilized.
CAUP	Calcium Uptake	
CCCL	Coccolith formation	One of the small, interlocking calcite plates covering members of the Coccolithophorida (unicellular, biflagellate, golden brown algae).
CDIN	Cardiac index	the heart output per unit of time over body surface, usually expressed in terms of liters per minute per square meter
CDOP	Cardiac output	A measurement of the blood flow through the heart to the systemic (and pulmonary) circulation. Cardiac output is expressed as volume of blood per unit time or liters/minute (Graylab on-line medical dictionary).
CDUP	Cadmium Uptake	
CEBS	Cytosolic estrogen-binding sites	Measure of estrogen binding with sites within cytosol
CFIX	Carbon Fixation	
CFLW	Coronary flow	The amount of blood flowing through the coronary artery.
CLFX	Chloride flux	Rate of movement of Chloride ions across membranes
CLNC	Clearance	The rate at which a substance is removed from the blood.
CLRC	Caloric content	The energy derived from food is described by its caloric content.
CLUP	Chloride uptake	Amount of chloride taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).
CMPS	Compression strength	The maximum load an object can withstand before failure (or specified deformation) under standard test conditions.
CMRB	Cholinergic muscarinic receptor binding	Distinct from the nicotinic cholinergic receptor in having no intrinsic ion channel, the receptor is formed from one protein chain with 7 transmembrane regions. The receptors produce their effect via activation of GTP-binding proteins. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?action=Home&query=)

PHY PHYSIOLOGICAL EFFECT		
CNVY	Conductivity	Degree to which a substance transmits (conducts) a given physical property, such as heat or electricity. (http://cancerweb.ncl.ac.uk)
CO2A	Carbon dioxide assimilation	Assimilation of carbon dioxide into an organism or tissue.
CO2F	CO2 Fixation	A mean in which photosynthetic bacteria obtain carbon for biosynthesis. Most commonly utilizing the Calvin cycle to convert CO2 to organic carbon. (instruct1.cit.cornell.edu/courses/biomi290/CO2FIX.html)
CO2T	Carbon Dioxide Tension, Partial Pressure of Carbon Dioxide, PCO2	
COCE	Coupling coefficient	The voltage change observed in a neuron when current is injected into another cell to which it is coupled by electrical synapses (http://www.nature.com/cgi-taf/DynaPage.taf?file=/nrn/journal/v2/n6/abs/nrn0601_425a_r.html)
COLD	Cold Hardiness	
COUP	Cobalt uptake	Amount of cobalt taken in by an organism or an organism's tissues.
CPCT	Capacitance	The property of an electric nonconductor that permits the storage of energy as a result of the separation of charge that occurs when opposite surfaces of the nonconductor are maintained at a difference of potential (Websters)
CRAT	Contraction rate	The rate at which a site contracts (e.g. muscle contraction)
CREX	Chromium excretion	Chromium excreted in the urine by an organism.
CRSP	Cellular respiration	The conversion within the cell of nutrients (such as sugar molecules) into chemical energy in the form of ATP, by reacting the food with oxygen (O2) until the food has completely been degraded into carbon dioxide and H2O. (http://cancerweb.ncl.ac.uk/omd/contents)
CRUP	Chromium uptake	Amount of chromium taken in by an organism or an organism's tissues.
CTIM	Clotting Time	
CTSL	Carbon translocation	The transfer of carbon from one part of an organism to another
CUUP	Copper Uptake	
CYSU	Cystine uptake	Amount of cystine taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).

PHY PHYSIOLOGICAL EFFECT		
DCRG	Discharge	a flowing or issuing out or something that is emitted (Webster's)
DFIX	Dark Fixation	No definition provided
DGST	Digestion	Digestion/digestibility. The conversion of food, in the stomach and intestines, into soluble and diffusible products, capable of being absorbed by the blood. (http://cancerweb.ncl.ac.uk/)
DORB	Dormancy Break	
DORI	Dormancy Induction	
DRRH	Diarrhea	abnormally frequent intestinal evacuations with more or less fluid stools (Webster's)
DSPS	Diastolic pressure	The intracardiac pressure during or resulting from the diastolic relaxation of a cardiac chamber; the lowest arterial blood pressure reached during any given ventricular cycle (Gray's)
DSTR	Diestrus	Period of sexual quiescence separating phases of the estrous cycle in polyestrous animals. (Gray's)
NRGA	Energy Assimilation	
ECPT	Energy charge potential	
ECTG	Electrocorticogram	A record of electrical activity derived directly from the cerebral cortex. (Gray's)
ECYC	Estrous cycle	The correlated phenomena of the endocrine and generative systems of a female mammal from the beginning of one period of estrus to the beginning of the next (MW online).
EECG	Electroencephalogram	
EEUR	Endogenous Excreted Urea	
EFFC	Efficiency	the ratio of the useful energy delivered by a dynamic system to the energy supplied to it (http://www.m-w.com/cgi-bin/dictionary)
EMCN	Emaciation	Extremely thin or physically wasted (Gray's)
ENST	Encystment	The process of forming or becoming enclosed in a cyst or capsule

PHY PHYSIOLOGICAL EFFECT		
EOCL	Electro-oculography	Recording of the average amplitude of the resting potential arising between the cornea and the retina in light and dark adaptation as the eyes turn a standard distance to the right and the left. The increase in potential with light adaptation is used to evaluate the condition of the retinal pigment epithelium. Electrodes are placed on the skin adjacent to the eyes measure changes in standing potential between the front and back of the eyeball as the eyes move. A sensitive electrical test for detection of retinal pigment epithelium dysfunction. (Gray's)
ERLD	Electroretinography light peak:dark trough ratio implicit time	The ratio of light peaks to dark troughs of the waves of the response of the test an in which an electrode is placed on the cornea of the eye to measure the electrical response of the rods and cones in the retina. It is useful in the evaluation of hereditary and acquired disorders of the retina. A normal test will show the appropriate pattern responses during moments of increased light intensity. Abnormal results can indicate arteriosclerosis of the retina, retinal detachment, temporal arteritis (with eye involvement) or vitamin A deficiency. (Gray's)
ERWA	Electroretinography wave amplitude	The wave amplitude response of the test an in which an electrode is placed on the cornea of the eye to measure the electrical response of the rods and cones in the retina. It is useful in the evaluation of hereditary and acquired disorders of the retina. A normal test will show the appropriate pattern responses during moments of increased light intensity. Abnormal results can indicate arteriosclerosis of the retina, retinal detachment, temporal arteritis (with eye involvement) or vitamin A deficiency. (Gray's)
ERWI	Electroretinography wave implicit time	The wave implicit time response of the test an in which an electrode is placed on the cornea of the eye to measure the electrical response of the rods and cones in the retina. It is useful in the evaluation of hereditary and acquired disorders of the retina. A normal test will show the appropriate pattern responses during moments of increased light intensity. Abnormal results can indicate arteriosclerosis of the retina, retinal detachment, temporal arteritis (with eye involvement) or vitamin A deficiency. (Gray's)
ERWL	Electroretinography wave latent time	The wave latent time response of the test an in which an electrode is placed on the cornea of the eye to measure the electrical response of the rods and cones in the retina. It is useful in the evaluation of hereditary and acquired disorders of the retina. A normal test will show the appropriate pattern responses during moments of increased light intensity. Abnormal results can indicate arteriosclerosis of the retina, retinal detachment, temporal arteritis (with eye involvement) or vitamin A deficiency. (Gray's)

PHY PHYSIOLOGICAL EFFECT		
ERWV	Electroretinography wave	A test in which an electrode is placed on the cornea of the eye to measure the electrical response of the rods and cones in the retina. It is useful in the evaluation of hereditary and acquired disorders of the retina. A normal test will show the appropriate pattern responses during moments of increased light intensity. Abnormal results can indicate arteriosclerosis of the retina, retinal detachment, temporal arteritis (with eye involvement) or vitamin A deficiency. (Gray's)
ESGM	Estrogen metabolism	the metabolism of estrogen to its breakdown products
ETRS	Estrus	That portion or phase of the sexual cycle of female animals characterized by willingness to permit coitus; readily detectable behavioral and other signs are exhibited by animals during this period. (Gray's)
ETSA	Electron Transfer System Activity	
EXCR	Excretion Rate	
EYTH	Erythema	A name applied to redness of the skin produced by congestion of the capillaries, which may result from a variety of causes, the etiology or a specific type of lesion often being indicated by a modifying term. (Gray's)
FATT	Obese	Heavy, overweight
FDCV	Food Conversion Efficiency	
FEPP	Fecal production	
FEUP	Iron Uptake	
FLUX	Rate of Movement of Ions Across Membranes	
FVOL	Fluid volume	The amount of space occupied by a three-dimensional object as measured in cubic units (http://www.m-w.com/cgi-bin/dictionary)
GAEX	Glycolic acid excretion	Excretion of glycolic acid, which often serves as a basic component of the extracellular compounds of microalgae and is also the main substrate of photorespiration.
GFRT	Glomerular Filtration Rate	

PHY PHYSIOLOGICAL EFFECT		
GLGN	Glucogenesis	The making of molecules of the sugar glucose within a living cell from something other than glycogen (a polysaccharide of glucose molecules). (cancerweb.ncl.ac.uk)
GLSY	Glycogen synthesis	The rate at which glycogen is produced in an organism
GLUP	Glucose uptake	Amount of glucose taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP)
GLYU	Glycine uptake	Amount of glycine taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).
GPHY	Physiology, General	Currently an ACQUIRE ONLY code. Change in the organic processes or functions of a plant or an organism. Examples of effects in this category include caloric content, cough frequency, granule or concretion formation, heartbeat, membrane permeability, metabolic stress, osmoregulation, , urine frequency, ventilatory rate.. Used when more than one measurement is coded for an ACQUIRE record.
GRAU	Granule/Grain Creation	
GSTF	Gas Transfer	
GYCU	Glycerol uptake	Amount of glycerol taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).
GYEX	Glycolate excretion	The excretion of a salt or ester of glycolic acid. (cancerweb.ncl.ac.uk)
H3BD	Hemicholinium-3 binding	A potent inhibitor of the high affinity uptake system for choline. It has less effect on the low affinity uptake system. Since choline is one of the components of acetylcholine, treatment with hemicholinium can deplete acetylcholine from cholinergic terminals. (http://cancerweb.ncl.ac.uk/)
H3UP	H-3 Uptake	Amount of H-3 taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).
HCFX	Hydrogen carbonate flux	Rate of movement of Hydrogen Carbonate ions across membranes
HGUP	Mercury uptake	Amount of mercury taken in by an organism or an organism's tissues.
HLSS	Alopecia, Hair loss	Absence of hair from skin areas where it is normally present.
HPRR	Heat production rate	
HPSR	High pressure	Increase in pressure in an organ or tissue (BPK)

PHY PHYSIOLOGICAL EFFECT		
HTDP	Heart Double Product	Heart rate * cardiac output.
HTRT	Heart Rate	
HYDR	Hydration	The incorporation of molecular water into a complex molecule with the molecules or units of another species.
HYTN	Hypertension	Persistently high arterial blood pressure. Hypertension may have no known cause (essential or idiopathic hypertension) or be associated with other primary diseases (secondary hypertension). (Gray's)
INRE	Input resistance	The input resistance, is defined as the ratio between the strengths of the resultant voltage response and the current that is injected in a neuron. (http://mrh.niddk.nih.gov/hagai/publ/decpoi/DefsMeth.html)
<IOUP>	Ion Uptake	
IUPT	Iodine Uptake	Amount of iodine taken in by an organism or an organism's tissues. (per Cobalt uptake in SOP).
IRRI	Irritation	
IVCD	Intraventricular conduction defects	Nonspecific intraventricular conduction defects are diagnosed when the QRS is modestly prolonged (< 120 msec) and the QRS pattern and axis are not typical of a hemiblock. The conduction delay is considered to occur beyond the Purkinje's myocardial gates and arises from slow cell-to-cell conduction. The phenomenon is common in patients with acute MI. No treatment is indicated.
JRAC	Junctional resistance (AC)	Measured by AC current. Measured junctional resistance is isolated from ground potential by seals and peripheral membrane resistances (http://link.springer-ny.com/link/service/journals/00424/fpapers/esc/contents/02/00896/paper/s00424-002-0896-8ch100).
JRDC	Junctional resistance (DC)	Measured by DC current. Measured junctional resistance is isolated from ground potential by seals and peripheral membrane resistances (http://link.springer-ny.com/link/service/journals/00424/fpapers/esc/contents/02/00896/paper/s00424-002-0896-8ch100).
KUPT	Potassium Uptake	
LDGT	Lipid digestion	The conversion of lipid, in the stomach and intestines, into soluble and diffusible products, capable of being absorbed by the blood.
LDPX	Lipid Peroxidation	

PHY PHYSIOLOGICAL EFFECT		
MBCR	Metallothionein Binding Capacity Ratio	The ratio of toxicant to toxicant-binding capacity of metallothionein (MT) in tissues. The ratio of unbound metal to metal binding capacity of metallothionein within an organism.
MCCL	Malocclusion	Inappropriate contact between the teeth on closure
MCCN	Microorganism Cenosis	A group of organisms in a self-sufficient community naturally occupying a small area with a uniform environment throughout.
MCUS	Mucus Production	
MGUP	Magnesium Uptake	
MILK	Milk	A fluid secreted by the mammary glands of females for the nourishment of their young (www.m-w.com)
MNER	Mineralization	Process of converting mineral or inorganic form (http://www.m-w.com/cgi-bin/dictionary?va=mineralization)
MNTL	Manganese translocation	The ability of an organism to move manganese from one location to another.
MNUP	Manganese Uptake	
MSTR	Metestrus	Short period following estrus during which the phenomena of estrus subside in those animals in which pseudopregnancy does not occur. (Gray's)
MYCO	Mycorrhizal Colonization	
NAFX	Sodium flux	Rate of movement of Sodium ions across membranes
NASM	Nitrogen assimilation	Amount of nitrogen assimilated
NAST	Nastic Movements	Movement of a flat plant part, oriented relative to the plant body and produced by diffuse stimuli causing disproportionate growth or increased turgor pressure in the tissues of one surface.
NAUP	Sodium uptake	The ability of an organism to remove sodium from a substrate and take sodium into its body.
NCOS	Na and Cl osmolality	The fractional contribution of Na ⁺ and Cl ⁻ to osmolality (Na ⁺ + Cl ⁻ /osmolality) (ECOREF#48368)
NEXC	Nitrogen excretion	Nitrogen excreted by organism
NFIX	Nitrogen Fixation	Change in ability of plants to fix nitrogen.
NIUP	Nickel Uptake	

PHY PHYSIOLOGICAL EFFECT		
NMYC	Non-mycorrhizal colonization	
NPRA	Net Photosynthetic Rate	
NRGF	Metabolic efficiency	
NRGI	Energy intake	
NRGM	Metabolized energy	
NRGX	Energy excreted	
NRSP	Neuroresponse	
NRUP	Neutral Red Uptake	
NRXN	Nerve reaction	Amount of time or a response of a nerve to a stimulus.
NTSL	Nitrogen translocation	The ability of an organism to move nitrogen from one location to another.
NUPT	Nitrogen Uptake	
NVAR	Nerve absolute refractory period	The period following excitation when no response is possible regardless of the intensity of the stimulus. (Gray's)
NVCV	Nerve conduction velocity	time it takes for a nerve to transmit a signal
NVRR	Nerve relative refractory period	The period between the effective refractory period and the end of the refractory period; fibres then respond only to high intensity stimuli and the impulses conduct more slowly than normally. (Gray's)
OCCP	Oxygen Carrying Capacity	
OSFG	Osmotic fragility	The susceptibility, or lack of resistance, of erythrocytes to haemolysis when exposed to increasingly hypotonic saline solutions. Measured by the erythrocyte fragility test. (Gray's)
OSMO	Osmolality	The osmolality of an ideal solution of a nondissociating substance that exerts the same osmotic pressure as the solution being considered.
OXYG	Oxygen Consumption	Quantifiable change in oxygen uptake by the test organism; for plants see PSE (photosynthesis).

PHY PHYSIOLOGICAL EFFECT		
OXYT	Oxygen Tension, Partial Pressure of Oxygen Dioxide, Po ₂	
PAMP	P amplitude	The P wave represents atrial depolarization - the time necessary for an electrical impulse from the sinoatrial (SA) node to spread throughout the atrial musculature (http://www.utoledo.edu/~xflores/ekgs-interpretation.htm)
PBAL	Ponderal balance	Is equal to [(Urine + Feces - Drinking Water - Consumed Food + (Weight Change/Initial Weight)) * 100 (EcoRef # 56796)
PBEX	Lead excretion	Lead excreted by organism
PBUP	Lead Uptake	
PDGT	Protein digestion	The conversion of protein, in the stomach and intestines, into soluble and diffusible products, capable of being absorbed by the blood.
PERA	Protein Efficiency Ratio	
PERM	Permeability, tissue, membrane	The ability of a membrane or other material to permit a substance to pass through it.
PEXC	Phosphorus excretion	Phosphorus excreted by organism
PGSY	Prostaglandin synthesis	Any of a group of components derived from unsaturated 20 carbon fatty acids, primarily arachidonic acid, via the cyclooxygenase pathway that are extremely potent mediators of a diverse group of physiologic processes. The abbreviation for prostaglandin is PG, specific compounds are designated by adding one of the letters A through I to indicate the type of substituents found on the hydrocarbon skeleton and a subscript (1, 2 or 3) to indicate the number of double bonds in the hydrocarbon skeleton for example, PGE ₂ . All of the prostaglandins act by binding to specific cell surface receptors causing an increase in the level of the intracellular second messenger cyclic AMP (and in some cases cyclic GMP also). The effect produced by the cyclic AMP increase depends on the specific cell type. Increased cyclic AMP increases prostaglandin synthesis leading to further increases in cyclic AMP. See also individual prostaglandins. (cancerweb.ncl.ac.uk)
PIGM	Pigmentation	Quantitative (ie., compared to the control) change in the pigment, e.g. melanization. Does not include chlorophyll (see CLR). If pigment levels are reported code in BCM.

PHY PHYSIOLOGICAL EFFECT		
PNUT	Phosphorus not excreted	Phosphorus utilized/Calcium ingested * 100
PPUP	Phosphate uptake	The ability of an organism to remove phosphate from a substrate and take phosphate into its body.
PRET	Phosphorus retained	Phosphorus retained/Calcium ingested * 100
PRIN	PR Intervals	The PR interval measures the beginning of arterial depolarization through the beginning of ventricular depolarization.
PRSY	Protein Synthesis	
PRUT	Phosphorus retention to utilization ratio	Ratio of Phosphorus retained (Utilized - Transferred to Egg) to Phosphorus utilized (ingested - excreted)
PSII	Photosystem II (PSII) Electron Transport Activity	
PSSR	Pressure	The act of pressing, or the condition of being pressed; compression; a squeezing; a crushing.
PSTR	Proestrus	Phase of the estrous cycle preceding estrus during which the Graafian follicle undergoes maturation. Applies to animals. (Gray's)
PSYN	Photosynthesis	Change in plant productivity indicated by change in ^{14}C or CO_2 uptake or oxygen production.
PTIM	Prothrombin time	The clotting of blood, also known as coagulation time or clotting time
PTRN	Phosphorus transfer	Per cent of phosphorus transferred to the egg, Phosphorus in egg/Phosphorus utilized x 100
PTUC	Protein Utilization Coefficient	
PTUT	Phosphorus transfer to utilization ratio	Perent of phosphorus transferred to the egg in relation to phosphorus utilized.
PUPT	Phosphorus Uptake	
QAMP	Q amplitude	Depolarization of the septum. It is the first downward (negative) deflection before the R wave. (http://www.udel.edu/HESC/physLab/TotalReview.htm)

PHY PHYSIOLOGICAL EFFECT		
QRSV	Decreased QRS voltage	QRS Complex = The deflections in an electrocardiographic tracing and represent ventricular activity of the heart.
QTIN	QT Interval	Time from electrocardiogram Q wave to the end of the T wave corresponding to electrical systole. (http://cancerweb.ncl.ac.uk/)
RAMP	R amplitude	Depolarization of the apex. It is a upward (positive) deflection. (http://www.udel.edu/HESC/physLab/TotalReview.htm)
RBCD	Relative bradycardia	Bradycardia = slow heart rate.
RCRA	Renal Clearance Ratio	
RESP	Respiration, O2 Production, CO2 Production	
RESQ	Respiration Quotient	
RPRT	Respiratory Rate	
SAMP	S amplitude	Depolarization of the ventricular wall. The S wave a downward (negative) deflection after an R wave. (http://www.udel.edu/HESC/physLab/TotalReview.htm)
SBNF	Swim bladder inflation	The ability for inflation of the swim bladder, a gas filled cavity found in the body cavity of most bony fishes.
SCGR	Scope for Growth	SFG= (energy consumed * assimilation efficiency) - energy lost through respiration
SENE	Senescence	The study of the biological changes related to aging.
SENI	Senescence Induced/Accelerated	
SENR	Senescence Retarded	
SEUP	Selenium Uptake	
SIDP	Siderophore production	Production of natural iron binding compounds that chelate ferric ions (which form insoluble colloidal hydroxides at neutral pH and are then inaccessible) and are then taken up together with the metal ion. (cancerweb.ncl.ac.uk)
SLVN	Salivation	To have a flow of saliva especially in excess (Webster's)
SOXA	Sulfide oxidation activity	

PHY PHYSIOLOGICAL EFFECT		
SOXG	Superoxide Generation	
SRLO	Spectral Reflectance/Shift to Longer Wavelengths	
SRSH	Spectral Reflectance/Shift to Shorter Wavelengths	
STAS	Stasis	A state of static balance or equilibrium
STCG	S-T changes	Related to EKG, S-T Segment. The line between the end of the S wave and the beginning of the T wave.
STIN	ST interval	Time interval from the ending of the S-wave until the ending of the T-wave (in milliseconds) (http://bct.tn.utwente.nl/Definitions.htm)
STOC	Stomatal Conductance	A plant property related to the ease with which water vapor escapes from plant leaves through small pores in the leaves know as stomata (http://www.co2science.org/dictionary/define_s.htm).
STOM	Stomatal Aperture	
STVL	Stroke volume	the total volume of blood pumped by the heart in a single beat
STWK	Stroke Work	The work done by the ventricle to eject a volume of blood into the aorta (http://www.oucom.ohiou.edu/CVPhysiology/CF019.htm).
SUPT	Sulfur uptake	A nonmetallic element that occurs either free or combined especially in sulfides and sulfates, is a constituent of proteins, exists in several allotropic forms including yellow orthorhombic crystals, resembles oxygen chemically but is less active and more acidic, and is used especially in the chemical and paper industries, in rubber vulcanization, and in medicine for treating skin diseases
SWEL	Swelling	
SYPS	Systolic Pressure	The pressure exerted on the walls of the arteries during the contraction phase of the heart. Considered abnormally elevated if consistently over 150 mmHg. Systolic blood pressure varies with age, sex, size and relative condition (Graylab on-line medical dictionary).
T34C	T3/T4 Conversion rate	The turnover of T3 divided by the turnover of T4 times 100 is the conversion rate (ECOREF#65157)

PHY PHYSIOLOGICAL EFFECT		
TAMP	T amplitude	The T wave represents the repolarization of the ventricles. On rare occasions, a U wave can be seen following the T wave. (http://www.utoledo.edu/~xflores/ekgs-interpretation.htm)
TEAR	Lacrimation, Tearing	Shedding of tears
TEUR	Total Excreted Urea	
TEVG	trans-epithelial voltage gradient	Measured by an electro-olfactogram. Ions of opposite charge actively transported across the apical membrane barrier through the paracellular pathway in response to the transepithelial voltage gradient. The osmotic gradient created by the net transepithelial flow of ions thus provides the driving force for liquid movement across the airway epithelium. (http://jap.physiology.org/cgi/content/full/91/2/797)
TEXT	Texture Change	
THBR	Thyroid Hormone Binding Ratio	Recommended nomenclature for T3 Uptake test. A ratio of the solid matrix uptake and the serum uptake (http://www.abbottdiagnostics.com/glossary/glossary_t.htm).
THRG	Thermoregulation	
TIRD	Languid, tired, weak	Drooping or flagging from exhaustion; indisposed to exertion; without animation; weak
TRAN	Transpiration	The passage of a gas or liquid (in the form of vapor) through the skin, a membrane, or other tissue.
USTS	Unknown estrus stage	Unknown/undetermined stage of the estrus cycle
VENT	Ventilation, Opercular Movements, Undulatory Movements	
VMRS	Vasomotor response	Vasomotor = Pertaining to the regulation of the constriction or expansion of blood vessels.
VSCR	Vascular resistance	An expression of the resistance offered by the systemic arterioles, and to a lesser extent by the capillaries, to the flow of blood. (Gray's)
WLSS	Water loss	A decrease in water in cells, organs tissues or bodies (BPK)
WTUP	Water uptake	
WILT	Wilt	

PHY PHYSIOLOGICAL EFFECT		
ZNUP	Zinc Uptake	

POP POPULATION GROUP		
POP POPULATION EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ABND	Abundance (Number of Organisms/Area; Density)	Number of individuals of a taxon per unit area equivalent to density. Comparison to controls; not related to time. Use for coding efficacy of removal of lice from fish.
BMAS	Biomass;	Includes Harvest Yield, Fruit or Seed Yield, Mass of Organism, Mass of Population.
CHLA	Chlorophyll A Content	Pigment found in photosynthetic cells; occurs in all organisms exhibiting aerobic photosynthesis.
CHLO	Chlorophyll Content	Pigment found in photosynthetic cells. Measurable change in chlorophyll content including chlorophyll content, chlorosis.
CNTL	Control	To reduce the incidence or severity of, especially of weeds or insects to innocuous levels
COVR	Cover, Canopy	Area covered by canopy
DBLT	Population doubling time	The time (usually reported in years) that it takes a population to double its present size.
DRFT	Drift	Change in the number of larval aquatic insects to travel a given distance in a stream.
DVRS	Diversity, Evenness	Change in number of species in a given area or index of species diversity (e.g. species richness, evenness).
EBCN	Effective Body Concentration	The body residue of a chemical that is associated with an effect.
GENT	Generation Time	
GPOP	Population Changes, General	Used when more than one measurement is coded for an ACQUIRE record.
INDX	Index to Population Size; Count, Number, Abundance	

POP POPULATION EFFECT		
IRIN	Intrinsic Rate of Increase	
LAGT	Lagtime	
LCON	Length/duration of a chemical effectiveness	Represents the duration of time that a chemical retains its efficacy against a species or population. Usually reported as the first day after application that a species appears in the treated area. BPK
LCYC	Lifecycle	Total time taken by adults to produce new adults
NCHG	Population Change (Change in N/Change in Time)	
NGEN	Number of generations	Number of generations in a population
PBMS	Biomass or Weight of Entire Population	
PBRA	Biomass Turnover Ratio (Population/Biomass)	A measure that depends directly on growth and reproduction and indirectly on fertility through the rate of increase
PCCP	Population Carrying Capacity	Change in the carrying capacity of the population.
PGRT	Population Growth Rate	Rate of growth. Equivalent to intrinsic rate of increase and maximum possible rate of growth for species populations and colonies. Calculated by relating biomass or abundance to time. Life table data, germination rates are also included.
PSYN	Photosynthesis	Photosynthesis of an entire population usually algae. Change in productivity indicated by change in ^{14}C or CO_2 uptake or oxygen production.
PRPE	Predator/Prey Dynamics	
RCLN	Colonization Rate	Change in ability to colonize an uninhibited substrate under toxicant stress.
RCPR	Recapture Ratio	Measure of size of an animal population; used to estimate the population size of a single species of highly mobile animals
SEXR	Sex Ratio	
STTL	Settling	

POP POPULATION EFFECT		
SURF	Surface Area	
SZDS	Size distribution	Number of organisms at certain lengths or weights measured within a population
THCH	Thatch accumulation	
TRAP	Trappability	
VIDX	Viability index	Number of survivors on day 4/numbers of survivors on day 1
WGHT	Weight	

REP REPRODUCTION GROUP		
REP REPRODUCTIVE EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ORSM	No resorbed embryos	No resorbed embryos
<ABNM>	Abnormal	DO not code REP ABNM. ABNM should be coded under MPH (when adult body structures are changing) or DVP (when embryo or juveniles are becoming abnormal throughout different lifestages)
ABRT	Abort	
AFST	Atretic follicle stage	The stage of development of the follicles in the ovary marked by degenerative follicles with shrunken, irregular borders (ECOREF#52243)
BDEP	Bird day egg production	number of eggs produced/number of birds alive * 100
<BMAS>	Biomass;	Includes Harvest Yield, Fruit or Seed Yield, Mass of Organism, Mass of Population..
BNDG	Pair Bonding Nesting Behavior	
BRED	Bred	to propagate plants or animals sexually
BTCF	Beat/Cross frequency	A standard sperm motility measurement, the beats per second divided by the number of times the head crosses the mean head trajectory per second (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)

REP REPRODUCTIVE EFFECT		
CLLT	Clutch length	Number of days in a row on which a hen lays an egg is referred to as the clutch length.
CLNE	Cloning efficiency	The ability of an organism to produce clones
CLPD	Clutch production	the time it takes to produce a clutch or the number of eggs in a clutch
CLUB	Clubbing (Hydra Reproduction)	
COUR	Courtship Behavior, Sexual behavior	
CRCE	Circular cells	A standard sperm motility measurement, the number of spermatozoa swimming in circles (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)
CYNG	Care of Young, Nest Attentiveness	
EBCN	Effective Body Concentration	The body residue of a chemical that is associated with an effect.
EGPN	Eggs per Nest	
EREM	Early resorbed embryos	Embryos resorbed during the early part of the reproductive cycle
FCND	Fecundity	The innate potential reproductive capacity of the individual organism, as denoted by its ability to form and separate from the body the mature germ cells.
FERT	Fertile, Fertility	Fertility - The capacity to conceive or induce conception.
FERZ	Fertilization	The physiochemical processes involved in the union of the male and female gametes to form the zygote.
FIDX	Fertility index	(Number fertile/Number cohabitated)*100
FRUT	Fruit, fruiting	The usually edible reproductive body of a seed plant; especially : one having a sweet pulp associated with the seed. (Webster's)
FTCC	Fertile cocoons	
FLOR	Floral Induction	
FRMS	Frames, Bees	
FRUH	Percent Fruit Harvested	

REP REPRODUCTIVE EFFECT		
GCCT	Germ cell count	Number of sperm or eggs in the gonad or sample
GERM	Germination	The beginning or the process of development of a spore or seed.
GEST	Gestation Rate	The percentage of mated females that delivered at least one viable fetus (58044)
GFST	Graafian follicle stage	The stage of development of the follicles in the ovary marked by large follicles bordered by an amphophilic egg membranes with a central core of eosinophilic yolk proteins (ECOREF#52243)
GMET	Gamete production	Creation of a sex cell, egg, or sperm.
GIDX	Gestation Index	
GMEN	Germination Energy	$GE = [(n1-n0)/t1 + (n2-n1)/t2 + (n3-n2)/t3 + \dots (ni-ni-1)/ti] * 100/R = 0/0$ <p>n1, n2, n3...ni = Cumulative germination counts on consecutive days t1, t2, t3...ti = numbers of days after beginning of test R = constant obtained by dividing 100 (which is a perfect germination percentage value for any species) by number of days on which first germination evaluations were made under international rules</p>
GREP	Reproduction, General	Change in male and/or female reproductive ability; fertilization and fertilization rate; vegetation reproductive processes. Used when more than one measurement is coded for an ACQUIRE record.
GSTT	Gestation Time	Gestation period = The period in mammals from fertilization to birth
HDEP	Hen-day egg production	number of eggs produced / number of live hens x 100
HHEP	Hen-housed egg production	The cumulative number of eggs produced by the flock divided by the number of birds originally placed in the flock. http://www.aphis.usda.gov/vs/ceah/cahm/Poultry/lay99de2.htm)
IFCC	Infertile cocoons	
INFL	Inflorescence	The group or arrangement in which flowers are borne on a plant. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?query=inflorescence)
INFT	Infertile	
LACG	Lactating	
LHMN	Mean amplitude of lateral head displacement	A standard sperm motility measurement, the average of all deviations of the head displacement from the mean head trajectory (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)

REP REPRODUCTIVE EFFECT		
LHMX	Maximum amplitude of lateral head displacement	A standard sperm motility measurement, the maximal deviation of the head displacement from the mean head trajectory (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)
LIDX	Lactation index	percent of animals alive at the 4 days that survive the 21 day lactation period
LNRY	Linearity	A standard sperm motility measurement, the distance in straight line divided by actual distance traveled (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)
LRM	Late resorbed embryos	Embryos resorbed during the late part of the reproductive cycle
MIDX	Mating index	Number of animals with seminal plugs or sperm/number of animals mated times 100 (www.ilo.org/public/english/protection/safework/ghs/ghsfinal/ghsc11.pdf)
MONT	Mounting, Copulation, Intercourse, Mating	A reproductive behavior in which one animal climbs atop a second animal. Also copulation, intercourse, and mating
MOTL	Motility	Sperm motility
MSPW	Mean spawns per female	The mean number of times a female has spawned.
NANT	Nests Abandoned	
NCLU	Corpus Lutea, Number of	
NDAY	Number of Days Between Eggs Laid	
NEGI	Number of Eggs Incubated	
NINC	Number of Nests Incubated	
NMNT	Non-mount	A reproductive behavior which does not occur. This includes one animal climbing atop a second animal. Also copulation, intercourse, and mating.
NOIM	Number of implantations	The number of embryos that attached to the maternal uterine wall (Webster's on-line).

REP REPRODUCTIVE EFFECT		
NOPN	Number of Organisms per Nest	
NPOD	Number of Pods	
NPRG	Not pregnant	not containing unborn young within the body
NREP	Non-reproducing organisms	Barren plants or organisms
NRPR	Net Reproductive Rate	(Ro) Average number of offspring or seeds produced by an individual in a population during its lifetime. Figured by the life table equation: $R_o = \sum l_x m_x$, where l_x = the probability of survival from birth to age x and m_x = the average number of births per individual of age x . (www.muw.edu/~mharvill/studch10.rtf and Population Biology: The Evolution and Ecology of Populations, Chapter 12, P.W.Hedrick)
NSNT	Successful Nests	
NSPN	Number Spawning	
NSTS	Number of Active Nests	
NSTI	Nest Initiation	
NSTS	Number of Nests Produced	
NTSZ	Nest Size	
NUNT	Unsuccessful Nests	
NVIB	Non-viable	not capable of living; especially : not capable of surviving outside the womb without artificial support (Webster's)
OBRD	Open Brood	
OEGP	Onset of Egg Production	
OOCY	Fully Developed Oocytes	
OVRT	Ovulation Rate	
PFST	Primary follicle stage	The stage of development of the follicles in the ovary marked by large nucleus, abundant basophilic cytoplasm and no yolk vesicles (ECOREF#52243)

REP REPRODUCTIVE EFFECT		
PILS	Post-implantation loss	The loss of implanted embryos. This is calculated by determining the ratio of dead to total implants from the treated group compared to the ratio of dead to total implants from the control group.
PIPD	Pipped	
PLBR	Pairs with Litter or Brood	
PREG	Pregnant, paris or gravid	Containing unborn young within the body , distended with or full of eggs
PRFM	Pregnant Females in a Population	
PROG	Progeny	Includes Counts, Numbers, Clutch, Litter or Brood Size, Progeny Produced Within a Specified Time Period, Numbers of Progeny per Parent Organism.
PRPL	Preimplantation loss	Loss of an embryo before uterine implantation (Webster's on-line).
PRTH	Parthenocarpny	Production of fruit without fertilization.
PSPG	Pseudopregnancy	False pregnancy. The term sometimes refers also to the premenstrual stage of the endometrium because it resembles the endometrium just before implantation of the blastocyst. (Gray's)
PSTG	Stage of Pregnancy	
RBEH	Reproductive Behavior Changes	
REPO	Reproducing organisms	Organisms that have produced offspring.
RPLM	Repeat bloom	Repeat bloom, or bloom in the next year (http://www.cahe.nmsu.edu/pubs/_h/h-321.html)
RPRD	Reproductive Capacity	
RSEM	Resorbed Embryos	
RSUC	Reproductive Success (General)	
SBRD	Sealed Brood	

REP REPRODUCTIVE EFFECT		
SDIX	Seed Index	Grams per 100 seeds (definition from paper).
SEED	Seed Number	
SEPD	Seed or spore production	Production of seed or spore by vegetative process
SFST	Secondary follicle stage	The stage of development of the follicles in the ovary marked by the presence of numerous eosinophilic yolk vesicles (ECOREF#52243)
SPCL	Sperm Cell Counts	
SPMC	Spermatocytes	a cell giving rise to sperm cells; especially : a cell that is derived from a spermatogonium and ultimately gives rise to four haploid spermatids (Webster's)
SPMG	Spermatogonia	a primitive male germ cell
SPNF	Spawning frequency	The number of times an organism spawns
SPRD	Sporophyte Production	
SSET	Seed Set (No. Seeds/No. Florets)	
STRL	Sterility	The inability to reproduce because of congenital or acquired reproductive system disorders involving lack of gamete production or production of abnormal gametes.
T50P	Time to 50% production	number of days to achieve 50% egg production.
TFPG	Time to first progeny	number of days to produce first litter.
TMNT	Time to mounting	Time it takes for a reproductive behavior to be exhibited. This includes one animal climbing atop a second animal. Also copulation, intercourse, and mating.
TPRG	Time to pregnancy/gravidity	Time from mating to first gravidity
<TPRD>	Total Production	
TSPN	Time to Spawn	

REP REPRODUCTIVE EFFECT		
TTPR	Time to peak reproduction	The time it take for adults to reach peak reproductive output.
TUPR	Tuber production	Tuber = The enlarged end of a rhizome in which food accumulates, as in potato.
VCTY	Velocity	A standard measure of sperm motility, the total distance traveled divided by time (Proc. Natl. Acad. Sci. (1997) Vol. 94, pp. 6842-6846)
VEGR	Vegetative Reproduction	
VIAB	Viable Offspring or Seed	
VPLG	Vaginal/Copulatory plug	A plug formed by the coagulation of semen; found in the vagina after copulation in certain animals, such as the baboon, rat, and squirrel (Gray's)
AEG AVIAN EGG EFFECT		
Measurement Code	Measurement Name	Measurement Definition
ALEG	Albumen Eggshell Quality (Haugh Units)	Haugh Units Scale objectively combines the thickness of the egg albumen and the weight of the egg to a single score that can be compared across all types of eggs (http://www.sunnyqueen.com.au/03_quality/quality.htm)
BLSP	Blood spots	Also called meat spots. Occasionally found on an egg yolk. Contrary to popular opinion, these tiny spots do not indicate a fertilized egg. Rather, they are caused by the rupture of a blood vessel on the yolk surface during formation of the egg or by a similar accident in the wall of the oviduct. Less than 1% of all eggs produced have blood spots. (http://www.georgiaeggs.org/pages/bloodspots.html)
BSCP	Basal cap	a roughly circular mass of crystalline material that tips mammillae
CRAK	Cracking	
ESIN	Eggshell Index	
FERT	Fertile, Fertility	The quality or state of being fertile. (Webster's) Use this effect-measurement pair when the fertility of avian eggs is studied.
LGTH	Length	
LSTE	Eggs lost	Eggs missing from the nest (could be due to parents eating eggs or removing eggs from the nest)

AEG AVIAN EGG EFFECT		
MMMC	Mamillary core	Structures composed of organic knobs which serve as crystallization sites on the outer surface of eggshell membranes
QUAL	Quality	
SHLL	Shell, Percent	
SIZE	Size	The physical magnitude, extent, or bulk : relative or proportionate dimensions .
SOFT	Softness	
STGH	Strength	The quality or state of being strong, power to resist force.
THIK	Thickness	Having or being of relatively great depth or extent from one surface to its opposite..
VIAB	Viable	
VOLU	Volume	The amount of space occupied by a three-dimensional object as measured in cubic units (as quarts or liters) : cubic capacity
WDTH	Width	The horizontal measurement taken at right angles to the length .
WGHT	Weight	The heaviness of an object.
YOLK	Yolk, Percent	

SYS ECOSYSTEM GROUP		
PRS SYSTEM PROCESSES EFFECT		
Measurement Code	Measurement Name	Measurement Definition
BGCM	Biogeochemical	Changes in whole system biogeochemical processes, e.g. sulfate reduction, denitrification, methanogenesis, nitrification, ammonification, net N or P removal.
CMIN	Carbon Mineralization	
CO2G	CO ₂ Generation	Carbon dioxide generation in a soil/litter microcosm system.
CO2P	CO ₂ Evolution	

PRS SYSTEM PROCESSES EFFECT		
DCMP	Decomposition	Change in rate of degradation of plant material.
GPPR	Gross Primary Productivity/Respiration	Change in ratio of system-level gross primary productivity to respiration.
GPRS	System processes, General	General code for ACQUIRE.
NITR	Nitrification	
NMIN	Net Mineralization	
OUPT	Oxygen uptake	Oxygen uptake in a soil/litter microcosm system.
PPRO	Primary Productivity	
SPRO	Secondary Productivity	Change in production of consumer level organisms (e.g. macroinvertebrates).
SRES	System Respiration	Change in rate of oxygen uptake by entire ecosystem, as opposed to individual or groups of organisms.
TROP	Efficiency of Trophic Transfer Between Different Levels in the Food Chain; Assimilation Efficiency	Change in efficiency of trophic transfers between different levels in the food chain, e.g. between primary producers and grazers.

NOC NO GROUP CODE

NOC NO GROUP CODE EFFECT		
Measurement Code	Measurement Name	Measurement Definition
MULT	Multiple Effects Reported as One Result	Change in more than one effect when data were reported as one result; this code is used with reservation. The use must be verified through consultation with at least one other reviewer to ensure that the effects can not be reported individually.
<NONE>	None	

NOC No GROUP CODE EFFECT		
NRNR	Endpoint Reported Without a Specific Effect	The author reported an endpoint, but not a specific effect.. This code is used with reservation. The use must be verified through consultation with at least one other reviewer to ensure that there are no effect reported.
~XXX [This is an EFFECT code- NOT A MEASURENT CODE]	Delayed Effect	Currently an ACQUIRE ONLY code. An effect (xxx) reported after the organisms are transferred to toxicant-free test chambers. A specific exception is clearance prior to tissue analysis; e.g., "after the exposure the organisms were placed in clean water for 10 hours to allow the organism to clear the stomach contents". This type of clearance is distinguished from depuration and is not coded as a delayed effect (see also page 4.C-10). Refer to Section 4.C-5. <u>Test Result Parameters</u> in the guidelines for additional information regarding coding of delayed effects.

Appendix T. Endpoint Codes and Definitions

ECOTOX ENDPOINTS		
DATABASE USAGE	ENDPOINT	DEFINITION
TERRETOX	ATCN	Asymptotic threshold concentration: The concentration of a chemical at which some percentage of a population of test organisms is in a state of approximate homeostasis for some prolonged period of time.
TERRETOX	BAF	Bioaccumulation factor: A value that is the "ratio of the concentration of a chemical in the organism to that in the medium (usually water). Bioaccumulation refers to both uptake of dissolved chemicals from water (bioconcentration) and uptake from ingested food and sediment residues." (Casarett et.al. 1986) For TERRETOX, use BAF to reflect concentration/ accumulation in tissues regardless of whether the author addresses the ratio as BAF or BCF. The use of a BCF code in the TERRETOX database will require prior approval.
AQUIRE	BCF	<p>Bioconcentration factor: A term describing the degree to which a chemical can be concentrated in the tissues of an organism in the <i>aquatic environment</i> as a result of exposure to waterborne chemical at steady state during uptake phase. The BCF is a value which is equal to the concentration of a chemical in one or more tissues of the exposed aquatic organism divided by the average exposure water concentration of a chemical in the test. (Rand 1995)</p> <p>Use BCF only when reported by author for water exposures ie., AQUIRE; if BCF reported for terrestrial organisms/plants code as BAF.</p> <p>BCFs of less than 1 and negative BCF values are suspect and should be looked at by the EPA data base coordinator. Reviewers will code the data and send the paper on to the EPA data base coordinator for review and approval. The BCF's less than 1 are coded as reported by the author and negative BCF values are coded as <1.</p>
AQUIRE	BCFD	Bioconcentration factor calculated using dry weight tissue concentration
TERRETOX AQUIRE	ECxx	Effective concentration for xx% of tested organisms.
TERRETOX AQUIRE	EC100	Effective concentration to 100% of test organisms
AQUIRE	EDxx	Effective dose for xx% of tested organisms

ECOTOX ENDPOINTS		
DATABASE USAGE	ENDPOINT	DEFINITION
AQUIRE TERRETOX	ERxx	Tissue concentration of toxicant needed to cause xx% effect in the test population. (ECOREF#51644) The ERxx concentration should be coded into the Concentration field and not the BCF field.
AQUIRE	ETxx	Effective time response to xx% of organisms. The time associated with the response is coded in the DURATION field.
TERRETOX AQUIRE	ICxx	Inhibition concentration to xx% of organisms.
TERRETOX AQUIRE	LCxx	Lethal concentration to xx% of test animals.
TERRETOX AQUIRE	LDxx	Lethal dose to xx% of test animals
AQUIRE	LETC	Lethal Threshold Concentration: Toxicity curve asymptotic concentration indicating an incipient LC50 value. Acute lethal action has essentially ceased.
AQUIRE	LOEC	Lowest observable effect concentration
TERRETOX	LOEL	Lowest-observable-effect-level: lowest dose (concentration) producing effects that were significantly different (as reported by authors) from responses of controls (LOEL/LOEC)
AQUIRE	LRxx	Lethal Residue Concentration. Tissue concentration of toxicant needed to cause xx% mortality in the test population. (ECOREF#20453) The LRxx concentration should be coded into the Concentration field and not the BCF field.
TERRETOX AQUIRE	LTxx	Lethal time, median: time required for xx% of a population to die from a given dose; also reported as "STxx" - survival time for xx% of a population. The time associated with the response is coded in the DURATION field.

ECOTOX ENDPOINTS		
DATABASE USAGE	ENDPOINT	DEFINITION
TERRETOX AQUIRE	MATC	Maximum Acceptable Toxicant Concentration: Hypothetical threshold concentration that is the geometric mean between the NOEC and LOEC concentration. The term Chronic Value (ChV) is encoded as MATC. Refer to companion endpoint note under LOEC definition
AQUIRE	NOEC	No observable effect concentration
TERRETOX	NOEL	No-observable-effect-level: highest dose (concentration) producing effects not significantly different from responses of controls according to author's reported statistical test (NOEL/NOEC)
TERRETOX AQUIRE	NR	Not reported
AQUIRE	NR-LETH	100% mortality or 0% survival of organisms
AQUIRE	NR-ZERO	0% mortality or 100% survival of organisms

Appendix U. Response Site Codes

CODE	Site Name	Site Definition/Notes
A		
AB	Aboveground Portion, Plant	
ABD	Abdomen	1. The portion of the vertebrate body between the thorax and the pelvis or the cavity of this part of the body. 2. The elongate region posterior to the thorax in arthropods.
ABP	Abdominal process	Found in a parthenogenic female cladoceran. A long second abdominal process of the post abdomen that extends beyond the base of the anal setae (www.epa.gov/waterscience/wet/disk2/pdf/apxal-a3.pdf)
AD	Adipose Tissue	A type of connective tissue specialized for lipid storage.
ADC	Auditory center	Area of the brain that detects auditory stimulus
AF	Amniotic Fluid	A substance that fills the amnion to protect the embryo from dessication and shock.
AG	Accessory Gland	A mass of glandular tissue separate from the main body of a gland. A gland associated with the male reproductive organs in insects.
AL	Albumen	Egg white
AM	Adductor Muscle	Any muscle that draws a part of the body toward the median axis.
ANG	Antennal Gland	(Green gland) An excretory organ in the cephalon of adult crustaceans
ANT	Antenna (Antennae)	A movable, articulated organ of sensation, attached to the heads of insects and Crustacea. There are two in the former, and usually four in the latter. They are used as organs of touch, and in some species of Crustacea the cavity of the ear is situated near the basal joint. In insects, they are popularly called horns, and also feelers. The term is also applied to similar organs on the heads of other arthropods and of annelids. (http://cancerweb.ncl.ac.uk)
AP	Appendages	Any subordinate or nonessential structure associated with a major body part. Any jointed, peripheral extension, especially limbs, or arthropod and vertebrate bodies.

CODE	Site Name	Site Definition/Notes
AR	Adrenal Gland	An endocrine organ located close to the kidneys of vertebrates and consisting of two morphologically distinct components, the cortex and medulla.
ART	Artery	A vascular tube that carries blood away from the heart.
AS	Air Sac	One of large, thin-walled structures associated with the tracheal system of some insects. In birds, any of the small vesicles that are connected with the respiratory system and located in bones and muscles to increase buoyancy.
AT	Alimentary Tract	Pertaining to the organs of digestion
ATA	Aorta	The largest artery in the body which has its origin at the heart. It gives off branches to the extremities, neck and major organs for the purpose of supplying oxygenated blood. (Gray's)
ATH	Abdomen and thorax	Sample consists of abdomen and thorax tissue.
ATM	Atrium	The chamber or either of the chambers of the heart that receives blood from the veins and forces it into the ventricle or ventricles (Webster's)
AX	Axons	The process or nerve fiber of a neuron that carries the unidirectional nerve impulse away from the cell body.
B		
BA	Bark	
BB	Bulb	
BC	Buccal mass	
BCT	Bract	A leaf-like structure, different from the foliage leaves and without an auxiliary bud, associated with an inflorescence or flower (Gray's)

CODE	Site Name	Site Definition/Notes
BD	Bud	An embryonic shoot containing the growing stem tip surrounded by young leaves or flowers or both and frequently enclosed by bud scales.
BDW	Body wall	Consists of the layers of tissue, including skin, connective tissue, and hypaxial muscle, which surround and contain the internal structures of the body
BI	Bile	An alkaline fluid secreted by the liver and delivered to the duodenum to aid in the emulsification, digestion, and absorption of fats.
BDT	Bile duct	A duct that carries bile from the liver and gallbladder to the duodenum (first part of the small intestine). (http://cancerweb.ncl.ac.uk)
BIL	Bill	
BIT	Biliary tract	The biliary tract is a system of ducts that transports bile out of the liver into the small intestine (http://arbl.cvmbs.colostate.edu/hbooks/pathphys/digestion/liver/anatomy.html)
BL	Blood	A fluid connective tissue consisting of the plasma and cells that circulate in the blood vessels.
BLC	Blood cells	An erythrocyte (red blood cell) or leukocyte (white blood cell)
BM	Bone Marrow	A vascular modified connective tissue occurring in the long bones and certain flat bones of vertebrates.
BMC	Bone marrow cells	Cells found in the bone marrow
BMP	Bone marrow plasma	Plasma from the bone marrow.
BO	Bone	One of the parts constituting a vertebrate skeleton.
BOD	Body use WO	
BOL	Bolls	A pod or capsule, as of cotton and flax.
BR	Brain	The portion of the vertebrate central nervous system enclosed in the skull.
BRN	Branches	
BRS	Brain stem	
BT	Breast	

CODE	Site Name	Site Definition/Notes
BU	Bursa	A simple sac or cavity with smooth walls containing a clear, slightly sickly fluid and interposed between two moving surfaces of the body to reduce friction.
BV	Blood Vessel	A tubular channel for blood transport.
BW	Bee's Wax	Yellow to grayish-brown solid wax obtained from bee honeycombs by boiling and straining..
BY	Byssus	
C		
CA	Cartilage	A specialized connective tissue which is bluish, translucent, and hard but yielding.
CAE	Caecum	The blind end of a cavity, duct, or tube, especially the sac at the beginning of the large intestine.
CAN	Canopy	The uppermost spreading branchy layer of a forest.
CAP	Cap, Mushroom	The convex, concave, or flattened spore-bearing structure of some basidiomycetes that is attached superiorly to the stem and typically is expanded with gills or pores on the underside - called also pileus.
CB	Cob	1 : the axis on which the kernels of Indian corn are arranged. 2 : an ear of Indian corn .
CBC	Cerebral cortex	The outer portion of the brain, consisting of layers of nerve cells and the pathways that connect them. The cerebral cortex is the part of the brain in which thought processes take place. (http://cancerweb.ncl.ac.uk)
CBH	Cerebral hemisphere	The two halves of the cerebrum, the largest part of the brain.
CBM	Cerebrum	An enlarged anterior or upper part of the brain; especially : the expanded anterior portion of the brain that in higher mammals overlies the rest of the brain, consists of cerebral hemispheres and connecting structures, and is considered to be the seat of conscious mental processes
CC	Cocoon	A protective case formed by the larvae of many insects, in which they pass the pupa stage.
CCM	Cecum	the blind pouch at the beginning of the large intestine into which the ileum opens from one side and which is continuous with the colon (www.m-w.com)

CODE	Site Name	Site Definition/Notes
CDB	Caudal Bone	
CDV	Caudal vertebrae	The vertebrae that form the skeleton of the tail. (http://cancerweb.ncl.ac.uk)
CE	Coelomic fluid	
CEL	Cell	The microscopic functional and structural unit of all living organisms.
CG	Cloacal gland	Any of the sweat glands in the cloaca of lower invertebrates, as snakes or amphibians.
CGG	Coagulating gland	Also known as the dorsal prostate, responsible for formation of a copulatory vaginal plug - preventing backflow of deposited semen (http://www.uwyo.edu/wjm/repro/maleanat.htm)
CRG	Cerebral ganglion	
CH	Spinal Cord,	The cordlike posterior portion of the central nervous system contained within the spinal canal of the vertebral column of all vertebrates.
CHP	Choroid plexus	Organ found within the ventricles of the brain and in the subarachnoid space around the brain and spinal cord that produces cerebrospinal fluid (http://www.ets.uidaho.edu/med532/choroid.htm)
CIL	Cilia	Relatively short, centriole-based, hairlike processes on certain anatomical cells and motile organisms.
CL	Claw	
CLM	Coelomocytes	A corpuscle, including amebocytes and eleocytes, in the coelom of certain animals, especially annelids.
CLN	Colon	The part of the large intestine that extends from the cecum to the rectum
CLT	Clitoris, Clitoral gland	a small erectile organ at the anterior or ventral part of the vulva homologous to the penis (Webster's)
CLV	Calvarium	the portion of the skull including the braincase and excluding the lower jaw and facial portion
CM	Crown to Rump	
CMB	Comb	a fleshy crest on the head of the domestic fowl and other gallinaceous birds (Webster's)
CN	Cotyledon	The first leaf of the embryo of seed plants.

CODE	Site Name	Site Definition/Notes
CO	Collagen	A fibrous protein found in all multicellular animals, especially in connective tissue.
COL	Coleoptile	The first leaf of a monocotyledon seedling.
COR	Corm	A short, erect, fleshy underground stem, usually broader than high and covered with membrane scales.
COS	Corpuscles of Stannius	These are islands of eosinophilic granular cells located in paired organs on the ventral surface of the kidney. This organ secretes a protein called hypocalcin (teleocalcin) which acts with calcitonin to regulate calcium metabolism. (http://www.afip.org/vetpath/POLA/POLA96/fish.txt)
CP	Capat	
CPS	Carpus	The joint, or the region of the joint, between the hand and the arm. The wrist.
to CRP		
CR	Crop	1) A plant or animal grown for its commercial value. 2) A distensible saccular diverticulum near the lower end of the esophagus of birds which serves to hold and soften food before passage into the stomach.
CRB	Cerebellum	Part of the vertebrate hindbrain, concerned primarily with somatic motor function, the control of muscle tone and the maintenance of balance.
CRI	Cervical rib	A rib which arises from the seventh cervical vertebrae (above the normal first rib). Occurs in only about 0.5% of people. May cause nerve and artery problems. (Gray's)
CRM	Cerebrum	The portion of the brain (frontal lobes) where thought and higher function reside.
CRP	Carapace	A dorsolateral, chitinous case covering the cephalothorax of many arthropods.
CRR	Cerebellar region	
CS	Chromosome	Any of the complex, threadlike structures seen in animal and plant nuclei during kariokinesis which carry the linearly arranged genetic material.

CODE	Site Name	Site Definition/Notes
CSF	Cerebrospinal fluid	a clear liquid which is very similar to the liquid portion of blood(plasma) and contains various salts and products such as sodium, calcium, bicarbonate, chloride, magnesium and glucose. The purpose of the CSF is as a medium for the transport of the chemicals to and from the brain, and also to provide buoyancy and protection for the brain. (http://www.geocities.com/TimesSquare/Dungeon/6214/csf.htm)
CT	Cephalothorax	the body division comprising the united head and thorax of arachnids and higher crustaceans
CTE	Ctenidium	The comb or featherlike respiratory apparatus of certain mollusks or a row of spines on the head or thorax of some fleas (MHSD)
CU	Culture Cells	
CUT	Cuticle	A layer of more or less solid substance which covers the free surface of an epithelial cell.
CV	Caudal Vertebra	Any of the small bones of the vertebral column that support the tail in vertebrates.
CVV	Cervical vertebrae	The seven segments of the vertebral column located in the neck. Synonym: vertebrae cervicales (http://cancerweb.ncl.ac.uk)
CVM	Calvarium	One of the bones that makes up the vault of the skull (in humans these are the frontal, 2 parietals, occipital and 2 temporals). (Gray's)
CVX	Cervix	the narrow outer end of the uterus
CX	Caudex	The main axis of a plant, including stem and roots.
CY	Cytosol	The fluid portion of the cytoplasm, that is, the cytoplasm exclusive of organelles and membranes.
CYT	Cytoplasm	The organized complex of inorganic and organic substances external to the nuclear membrane of a cell and including the cytosol and membrane-bound organelles (as mitochondria or chloroplasts)
D		
DG	Digestive Gland	Any structure that secretes digestive enzymes.

CODE	Site Name	Site Definition/Notes
DN	Diencephalon	In vertebrate CNS the most rostral part of the brainstem, consisting of the thalamus, hypothalamus, subthalamus and epithalamus. It is a key relay zone for transmitting information about sensation and movement and also contains (in the hypothalamus) important control mechanisms for homeostatic integration.
DO	Duodenum	
DT	Digestive Tract	The alimentary canal.
E		
EA	Ear (Corn or Rice)	
EAL	Ear leaf (Corn)	
EC	Excreta	Excretion products; waste materials excreted by the body.
ED	Endometrium	The tissue lining the uterus, it is sloughed off during the woman's menstrual period, and afterward grows back and slowly gets thicker and thicker until the next period. (cancerweb.ncl.ac.uk)
EG	Egg	Ova
EL	Elytrom	
EM	Embryo	1) In animals, those derivatives of the fertilized ovum that eventually become the offspring during their period of most rapid development. 2) In plants, the element of the seed that develops into a new individual.
EMS	Embryonic shoot cells	
EN	Entrails	
EP	Endoplasmic Reticulum	A vacuolar system of the cytoplasm in differentiated cells that functions in protein synthesis and sequestration.
EPD	Epididymis	A system of ductules emerging posteriorly from the testis that holds sperm during maturation and that forms a tangled mass before uniting into a single coiled duct which is continuous with the vas deferens
ER	Erythrocyte	Red blood cell.
ES	Esophagus	The tubular portion of the alimentary canal interposed between the pharynx and the stomach.

CODE	Site Name	Site Definition/Notes
ET	Edible Tissue	
EU	Egg Cuticle	
EV	Exuviae	
EX	Exoskeleton	The external supportive covering of certain invertebrates, such as arthropods.
EY	Eye	
EYS	Eyestalk	One of the moveable peduncles bearing an eye at the tip in a decapod crustacean (Merriam-Webster)
EZ	Enzyme	Any of a group of catalytic proteins that are produced by living cells and that mediate and promote the chemical processes of life without themselves being altered or destroyed.
F		
F1	F1 Generation	the immediate offspring of a parent generation
FAC	Face	The part of the head in which the eyes, cheeks, nose, and mouth are situated. (Gray's)
FB	Frontal Bone	Of or pertaining to the forehead or the anterior part of the roof of the brain case; as, the frontal bones.
FBR	Forebrain	The anterior of the three primary divisions of the developing vertebrate brain or the corresponding part of the adult brain that includes especially the cerebral hemispheres, the thalamus, and the hypothalamus and that especially in higher vertebrates is the main control center for sensory and associative information processing, visceral functions, and voluntary motor functions -- called also prosencephalon (Webster's)
FC	Feces	The waste material eliminated by the gastrointestinal tract.
FD	Frond	The leaf of a palm or fern.
FE	Feathers	
FG	Foregut	The anterior part of the alimentary canal of a vertebrate embryo that develops into the pharynx, esophagus, stomach, and extreme anterior part of the intestine
FI	Fin	A paddle-shape appendage on fish and other aquatic animals that is used for propulsion, balance, and guidance.

CODE	Site Name	Site Definition/Notes
FIB	Fibula	A long bone in the lower leg that is adjacent to the tibia. The fibula supports approximately 1/6th of the body weight and produces the lateral (outer) prominence of the ankle. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?fibula)
FL	Fillet	A boneless slice of meat or fish.
FLB	Flower Bud	
FLW	Flower/ Inflorescence	
FM	Femur	The proximal bone of the hind or lower limb in vertebrates.
FMD	Femur diaphysis	The shaft of the femur. (Gray's)
FMM	Femur metaphysis	A conical section of the femur between the epiphysis (area where growth occurs) and diaphysis (the shaft of the bone). (Gray's)
FO	Foot	
FOD	Fodder	
FOL	Foliage	The aggregate of leaves of one or more plants.(MW on-line)
FOR	Forage	A vegetable food for domestic animals.
FP	Fatpad	
FR	Fruit	A fully matured plant ovary with or without other floral or shoot parts united with it at maturity.
FRL	Forelimb	A front limb of a quadruped. (http://cancerweb.ncl.ac.uk)
G		
GB	Gall Bladder	A hollow, muscular organ in vertebrates which receives dilute bile from the liver, concentrates it, and discharges it into the duodenum.
GF	Green forage	
GG	Green Gland	(antennal gland) An excretory organ in the cephalon of adult crustaceans
GI	Gills	The respiratory organ of water-breathing animals. (Also branchia)
GC	Gland Complex	

CODE	Site Name	Site Definition/Notes
GL	Ganglion	A mass of nerve tissue containing nerve cells external to the brain or spinal cord.
GMT	Germ tube	
GNP	Genital papillae	Tactile or sensory organs located near genitalia as raised bumps or nipples on a tissue surface
GNT	Gnathopod	A gnathopodite or maxilliped which is any leglike appendage of a crustacean, when modified wholly, or in part, to serve as a jaw, especially. (cancerweb.ncl.ac.uk)
GO	Gonads	A primary sex gland; an ovary or a testis.
GOL	Golgi Apparatus	A cellular organelle that is part of the cytoplasmic membrane system; it is composed of regions of stacked cisternae and it functions in secretory processes.
GP	Gills+Palps	
GPD	Gonopodium	the pelvic fins of male fish that have been converted into genital organs. (http://www.exotictropicals.com/encyclo/information/aquarium_glossary.htm)
GR	Grain	
GS	Germinated seed	
GT	Gastrointestinal Tract	The stomach and intestine.
GU	Gut	The intestine. The embryonic, digestive tube.
GZ	Gizzard	The muscular portion of the stomach of most birds where food is ground with the aid of ingested pebbles.
H		
HA	Hair	A threadlike outgrowth of the epidermis of animals.
HAY	Hay	Hay
HC	Hypocotyl callus cells	
HD	Head	
HDG	Hindgut	The posterior part of the alimentary canal (Webster's)
HE	Heart	

CODE	Site Name	Site Definition/Notes
HIP	Hippocampus	A curved elongated ridge that extends over the floor of the descending horn of each lateral ventricle of the brain and consists of gray matter covered on the ventricular surface with white matter (Webster's)
HK	Heart and Kidneys	Sample consists of heart and kidney tissue.
HKG	Husk and grain	
HL	Hemolymph	The circulating fluid of the open circulatory systems of many invertebrates.
HLB	Hindlimb	Either of two extremities of four-footed non-primate land animals. It usually consists of a femur, tibia and fibula, tarsals, metatarsals, and toes. (http://cancerweb.ncl.ac.uk)
HM	Humerus	The proximal bone of the forelimb in vertebrates.
HMC	Hemocyte	A cellular element of blood, especially in invertebrates.
HO	Honey	The sweet, viscous secretion composed principally of levulose and dextrose that is deposited in the honeycomb by the honeybee.
HOD	Hyoid	Of or pertaining to the bony or cartilaginous arch which supports the tongue (Gray's).
HP	Hepatopancreas	A gland in crustaceans and certain other invertebrates that combines the digestive functions of the liver and pancreas of vertebrates.
HSK	Husk	
HTC	Heterocyst	Clear, thick-walled cell occurring at intervals along the filament of certain blue-green algae.
HTG	Hatching gland	A transversely oriented set of cells located deep to the enveloping layer on the pericardial membrane, especially during the pharyngula period because of the brightly refractile cytoplasmic granules containing hatching enzymes in the cells. (http://www.purehrottle.com/briancoad/Dictionary/H.html)
HY	Hypothalamus	The floor of the third brain ventricle; site of production of several substances that act on the adenohypophysis.
HYA	Hypha	Also known as Hyphae or Hyphal. One of the threads that make up the mycelium of a fungus, increase by apical growth, and are coenocytic or transversely septate (Webster's)

CODE	Site Name	Site Definition/Notes
HYD	Hypodermis	1. The outermost cell layer of the cortex of plants, aka exodermis. 2. The layer of cells that underlies and secretes the cuticle in arthropods and other invertebrates.
HYP	Hypocotyl	The portion of the embryonic plant axis below the cotyledon.
I		
IB	Interparietal Bone	Between the parietal bones or cartilages; as, the interparietal suture.
IE	Ileum	The last portion of the small intestine that communicates with the large intestine.
IL	Ilium	The dorsal, upper, and largest one of the three bones composing either lateral half of the pelvis.
IN	Intestinal Tract	
IR	Interrenal gland	
IT	Internode	The interval between two nodes, as on a stem or along a nerve fiber.
J		
JA	Jaw	Either of two bones forming the skeleton of the mouth of vertebrates. Also known as mandible.
JE	Jejunum	The section of the small intestine that comprises the first two fifths beyond the duodenum and that is larger, thicker-walled, and more vascular and has more circular folds than the ileum (Webster's)
JV	Juvenile	Physiologically immature or undeveloped lifestage.
K		
KI	Kidney	Either of a pair of organs involved with the elimination of water and waste products from the body of vertebrates.
KIL	Kidney, left	Either of a pair of organs involved with the elimination of water and waste products from the body of vertebrates.
KIR	Kidney, right	Either of a pair of organs involved with the elimination of water and waste products from the body of vertebrates.
KR	Kernal	A whole grain or seed of a cereal plant, such as corn or barley.

CODE	Site Name	Site Definition/Notes
L		
LAM	Laminae	the expanded part of a foliage leaf
LC	Leaf chloroplast	A type of cell plastid occurring in the green parts of plants, containing chlorophyll pigments, and functioning in photosynthesis and protein synthesis.
LD	Lipid, Fat	One of a class of compounds which contain long-chain aliphatic hydrocarbons and their derivatives; includes waxes, fats, and derived compounds.
LE	Leaf /Needle	
LEI	Leaf Index	
LEN	Lens	
LEO	Leaf, Old	
LEU	Leukocytes	Also known as white blood cells. White corpuscles in the blood. They are spherical, colorless and nucleated masses involved with host defenses. (cancerweb.ncl.ac.uk)
LEY	Leaf, Young	
LG	Leg	
LI	Liver	A large vascular gland in the body of vertebrates consisting of a continuous parenchymal mass covered by a capsule; secretes bile, manufactures certain blood proteins and enzymes, and removes toxins from the systemic circulation.
LIM	Liver microsomes	In the hepatocyte, any of the vesicular fragments of endoplasmic reticulum formed after disruption and centrifugation of cells. (Gray's)
LIN	Large intestine	the more terminal division of the vertebrate intestine that is wider and shorter than the small intestine, typically divided into cecum, colon, and rectum, and concerned especially with the resorption of water and the formation of feces
LIP	Lip	Either of the two fleshy folds which surround the orifice of the month. (Websters Dictionary)
LIT	Litters	Offspring
LM	Limb	1) An extremity or appendage used for locomotion or prehension. 2) A large primary tree branch

CODE	Site Name	Site Definition/Notes
LMP	Lymphocyte	White cell of the blood that are derived from stem cells of the lymphoid series. (http://cancerweb.ncl.ac.uk)
LMV	Lumbar vertebrae	The vertebrae, usually five in number, located in the lumbar region of the back. Synonym: vertebrae lumbales. (http://cancerweb.ncl.ac.uk)
LP	Labial Palps	1) Either of a pair of fleshy appendages on either side of the mouth of certain bivalve mollusks. 2) A jointed appendage attached to the labium of certain insects.
LU	Lungs	Either of the paired air-filled sacs which function as organs of respiration.
LV	Left ventricle	The muscular chamber of the heart which accepts blood from the left atrium and ejects it into the aorta to the systemic circulation. (http://www.graylab.ac.uk/cgi-bin/omd?left+ventricle)
LY	Lysosome	A specialized cell organelle surrounded by a single membrane and containing a mixture of hydrolytic (digestive) enzymes.
M		
MA	Mantle	An enveloping layer, as the external body wall lining the shell of many invertebrates, or the external meristematic layers in a stem apex.
MB	Muscle+Bone	
MBR	Midbrain	The part of the brain above the pons and below the thalamus, it is the uppermost part of the brainstem, and is involved in basic, unconscious body function. (Gray's)
MC	Microsome	A fragment of the endoplasmic reticulum. A minute granule of protoplasm.
ME	Meristem (apical or axillary)	Meristem - Formative plant tissue composed of undifferentiated cells capable of dividing and giving rise to other meristematic cells as well as specialized cell types.
MES	Mesentery	The membranes, or one of the membranes (consisting of a fold of the peritoneum and inclosed tissues), which connect the intestines and their appendages with the dorsal wall of the abdominal cavity. The mesentery proper is connected with the jejunum and ileum, the other mesenteries being called mesocum, mesocolon, mesorectum, etc. (http://cancerweb.ncl.ac.uk)

CODE	Site Name	Site Definition/Notes
MI	Midgut and Midgut Gland	The middle portion of the digestive tube in vertebrate embryos.
MIT	Mitochondria	Minute cytoplasmic organelles in the form of spherical granules, short rods, or long filaments found in almost all living cells.
MK	Milk, lactating females	
MM	Mammary Tissue	
MO	Mucous	A viscid fluid secreted by mucus glands
MOB	Medulla oblongata	The lowest subdivision of the brainstem, immediately adjacent to the spinal cord. Houses important cardiac and respiratory regulatory centres.
MOM	Mother cells, pollen	
MR	Membrane	A thin layer of tissue surrounding a part of the body, separating adjacent cavities, lining cavities, or connecting adjacent structures.
MRC	Motor cortex	Area of the frontal lobe concerned with primary motor control. It lies anterior to the central sulcus. (http://cancerweb.ncl.ac.uk/cgi-bin/omd?motor+cortex)
MS	Mesenteric Lymph Node	
MSC	Mesencephalon	The middle segment of the brain; the midbrain.
MT	Multiple Tissue/ Organs	AQUIRE code. Used when multiple sites are coded for one record. The individual sites are reported as a REMARK. This code will be changed to MUL at a later date.
MTC	Metacarpus	The part of the hand or forefoot that contains the metacarpals.
MTM	Mentum	The front median plate of the labium in insects (cancerweb.ncl.ac.uk)
MU	Muscle	A tissue composed of cells containing contractile fibers; three types are smooth, cardiac, and skeletal.
MUL	Multiple Sites	
MV	Microvilli	One of the filiform processes that form a brush border on the surfaces of certain specialized cells, such as intestinal epithelium.
MYC	Mycellium	Mass of interwoven filamentous hyphae that forms especially the vegetative portion of the thallus of a fungus.

CODE	Site Name	Site Definition/Notes
MYM	Myometrium	Uterine smooth muscle.(cancerweb.ncl.ac.uk)
N		
NAC	Nucleus accumbens	The largest neuronal nucleus in the septal region of the diencephalon in the brain. (Gray's)
NB	Nasal Bone	Either of two small elongated rectangular bones that together form the bridge of the nose.
NC	Nerve Cord	a hollow tube that runs beneath the dorsal surface of the animal above the notochord (the principle nerve cord in the invertebrates, by contrast, is almost always located near the ventral surface
ND	Nodule, root	A bulbous enlargement found on roots of legumes and certain other plants, whose formation is stimulated by symbiotic, nitrogen-fixing bacteria that colonize the roots.
NE	Nervous Tissue	The nerve cells and neuroglia of the nervous system.
NG	Nasal Gland	
NK	Neck	A constricted portion, such as the part connecting the head and trunk of the body.
NL	Needle	A slender-pointed leaf, as of the firs and other evergreens.
NR	Not Reported	
NU	Nuclei	
NVL	Navel	A mark or depression in the middle of the abdomen; the umbilicus. (Gray's)
NY	Nymph	Any of various immature insects; especially : a larva of an insect with incomplete metamorphosis that differs from the adult especially in size and in its incompletely developed wings and genitalia.
O		
OC	Oocyte	An egg before the completion of maturation
OD	Oviduct	A tube that serves to conduct ova from the ovary to the exterior or to an intermediate organ such as the uterus (Fallopian tube)
OF	Orifice	an opening (as a vent, mouth, or hole) through which something may pass (Webster's)

CODE	Site Name	Site Definition/Notes
OG	Organ	A differentiated structure of an organism composed of various cells or tissues and adapted for a specific function.
OL	Olfactory	Pertaining to olfaction, or the sense of smell.
OPR	Operculum	
OR	Organelle	A specialized subcellular structure, such as mitochondrion, having a special function.
OS	Osphradium	in Littorina; an organ capable of sensing chemical changes in the environment
OTO	Otoliths	A calcareous concretion on the end of a sensory hair cell in the vertebrate ear and in some invertebrates.
OV	Ovaries	A glandular organ that produces hormones and give rise to ova in female vertebrates.
P		
PA	Palps	Any of various sensory, usually fleshy appendages near the oral aperture of certain invertebrates.
PAN	Panicle	A branched or compound raceme in which the secondary branches are often racemose as well.
PB	Pseudobranch	
PC	Pyloric ceca	1) One of the tubular pouches that open into the ventriculus of an insect. 2) One of the paired tubes having lateral glandular diverticula in each ray of a starfish. 3) One of the tubular pouches that open from the pyloric end of the stomach into the alimentary canal of most fishes.
PD	Pod	
PE	Penis	The male organ of copulation in vertebrates. Also known as phallus.
PEP	Pecten epipharyngis	
PES	Petiole and Stem	Both the a slender stem that supports the blade of a foliage leaf and the main trunk of a plant or a primary plant axis that develops buds and shoots instead of roots
PF	Pseudofeces	

CODE	Site Name	Site Definition/Notes
PG	Prostate Gland	A gland in the male which surrounds the neck of the bladder and the urethra. The prostate contributes to the seminal fluid.
PGL	Preening gland	A relatively large, compact bilobed secretory organ located at the base of the tail (uropygium) of most birds having a keeled sternum. Also known as oil gland or uropygial gland. (McGraw-Hill)
PHG	Pheromone gland	A gland that secretes a chemical stimulant/attractant that is released into the surrounding environment, either air or water.
PHL	Phalanges	The finger bones (http://cancerweb.ncl.ac.uk/cgi-bin/omd?phalanges)
PI	Pituitary Gland	(hypophysis) An epithelial body located at the base of the brain. Consists of two lobes. Secretes hormones.
PL	Plasma	The fluid portion of blood or lymph.
PLA	Platelet	A discoid cell (3m diameter) found in large numbers in blood, important for blood coagulation and for haemostasis by repairing breaches (small breaks) in the walls of blood vessels. (cancerweb.ncl.ac.uk)
PLC	Placenta	1) A vascular organ that unites the fetus to the wall of the uterus. 2) A plant surface bearing a sporangium.
PLL	Pellicle	The outer membrane of protozoans.
PLN	Popliteal nodes	Two groups of nodes located in the popliteal fossa: the superficial popliteal lymph nodes, located around the termination of the small saphenous vein, that drain the skin of the back of the leg and lateral side of the foot; and the deep popliteal lymph nodes, located around the popliteal vessels, that drain the superficial group, the deep structures of the leg, and the knee joint. Also, Popliteal lymph node, nodi lymphatic popliteales
PLP	Pulp	the soft, succulent part of a fruit usually composed of mesocarp (MW)
PLT	Palate	The roof of the mouth. (http://cancerweb.ncl.ac.uk)

CODE	Site Name	Site Definition/Notes
PLV	Pelvis	The pelvis is a basin shaped cavity bordered by the pelvic girdle and sacrum, containing and protecting the bladder, rectum and reproductive organs.(http://cancerweb.ncl.ac.uk)
PM	Pons + Medulla	A rounded eminence off the ventral surface of the brainstem (pons) and the lowest subdivision of the brainstem, immediately adjacent to the spinal cord (medulla). (Gray's)
PO	Pollen, pollen grain	
PPG	Preputial gland	A small scent gland in the human male which secretes the smegma. Also known as Tyson's gland. (McGraw-Hill)
PR	Proventriculus	1) A sac anterior to the gizzard in earthworms. 2) The true stomach of a bird, usually separated from the gizzard by a constriction.
PRF	Particulate fraction	
PRG	Progeny	Offspring, descendants
PRT	Peritoneum	also peritoneum. The smooth serous membrane which lines the cavity of the abdomen, or the whole body cavity when there is no diaphragm, and, turning back, surrounds the viscera, forming a closed, or nearly closed sac (Grey on-line medical Dictionary)
PS	Pancreas	A composite gland in most vertebrates that produces and secretes digestive enzymes, as well as at least two hormones, insulin and glucagon.
POS	Pod + Seed	
PT	Petioles	The stem which supports the blade of a leaf.
PTB	Parietal Bone	The side bone of the skull.
PTG	Parotid gland	A salivary gland situated in front of and below the ear. (Gray's)
PTU	Plant, Unspecified	
PU	Pollen tube	The tube produced by the wall of a pollen grain which enters the embryo sac and provides a passage through which the male nuclei reach the female nuclei.

CODE	Site Name	Site Definition/Notes
PX	Pharynx	A chamber at the oral end of the vertebrate alimentary canal, leading to the esophagus.
R		
RA	Radius	One of two bones which constitute the forearm. The largest portion of the radius is at the wrist joint where it articulates with the carpal bones of the hand. (http://cancerweb.ncl.ac.uk)
RAC	Rachis	Elongated axis of an inflorescence.
RAD	Radius, distal	One of two bones which constitute the forearm situated away from the point of attachment or origin. The largest portion of the radius is at the wrist joint where it articulates with the carpal bones of the hand. (http://cancerweb.ncl.ac.uk)
RB	Rib	One of the curved bones attached to the vertebral column and supporting the lateral walls of the thorax. (http://cancerweb.ncl.ac.uk)
RBC	Erythrocytes	A type of blood cell that contains a nucleus in all vertebrates but humans and that has hemoglobin in the cytoplasm also known as red blood cell or corpuscle.
RC	Rectum	The portion of the large intestine between the sigmoid flexure and the anus.
RD	Radicle	
RG	Rectal gland	In Sharks: rectal gland is a highly specialized organ whose only function is to pump salt
RH	Rhizome	An underground horizontal stem, often thickened and tuber-shaped, and processing buds, nodes, and scale-like leaves.
RL	Root, Lateral	
RLP	Root, Primary lateral	
RLS	Root, Secondary lateral	
RM	Retractor Muscle	A muscle that draws a limb or other body part toward the body.
RO	Root	The absorbing and anchoring organ of a vascular plant; it bears neither leaves nor flowers and is usually subterranean.
ROC	Root Cortex	
ROE	Root, epidermis	

CODE	Site Name	Site Definition/Notes
ROI	Root, Inner cortex	
ROO	Root, Outer cortex	
ROS	Root, Stele	The arrangement of vascular bundles in roots
RP	Root, Primary	
RPP	Renal papilla	The apex of a renal pyramid that projects into a minor calyx; some 10 to 25 openings of papillary ducts occur on its tip, forming the area cribrosa. (Gray's)
RR	Residual, Remnant, Carcass	
RS	Root + Stem	
RT	Reproductive Tissue	
RTC	Root tip cells	
RTP	Root tips	Terminal end of a root.
RU	Radius-Ulna	
RZ	Root + Rhizome	
S		
SA	Salt Gland	A compound tubular gland, located around the eyes and nasal passages in certain marine turtles, snakes, and birds, which copiously secretes a watery fluid containing a high percentage of salt.
SAP	Sap	The fluid part of a plant; specifically: a watery solution that circulates through
SB	Shell, Membrane	
SB2	Stem/Stalk, Lower Half	
SC	Scale	1) A flat calcified or cornified platelike structure on the skin of most fishes and of some tetrapods. 2) The bract of a catkin.
SCM	Scrotum	the external pouch that in most mammals contains the testes (Webster's)

CODE	Site Name	Site Definition/Notes
SCP	Scapula	A large, flat, triangular bone that forms the posterior portion of the shoulder. It articulates with the clavicle (at the acromion process) and the humerus (at the glenoid). (http://cancerweb.ncl.ac.uk)
SCV	Sacral vertebrae	The segments of the vertebral column, usually five in number, that fuse to form the sacrum. Synonym: vertebrae sacrales. (http://cancerweb.ncl.ac.uk)
SD	Seed	A fertilized ovule containing an embryo which forms a new plant upon germination.
SDL	Seedling	A plant grown from a seed.
SDM	Subdermis	area below the skin
SE	Sensory Organs	
SEM	Semen	a viscid whitish fluid of the male reproductive tract consisting of spermatozoa suspended in secretions of accessory glands
SG	Shell Gland	1) An organ that secretes the embryonic shell in many mollusks. 2) A specialized structure attached to the oviduct in certain animals that secretes the egg-shell material.
SH	Stomach	The tubular or saccular organ of the vertebrate digestive system located between the esophagus and the intestine and adapted for temporary food storage and for the preliminary stages of food breakdown.
SHF	Stomach or rumen fluid	Fluid found in the stomach or rumen
SI	Siphon	1) A tubular element in various algae. 2) A tubular structure for intake or output of water in bivalves and other mollusks. 3) The sucking-type of proboscis in many arthropods.
SIN	Small intestine	the part of the intestine that lies between the stomach and colon, consists of duodenum, jejunum, and ileum, secretes digestive enzymes, and is the chief site of the absorption of digested nutrients
SINM	Small intestine mucosa	A mucous membrane or tunica mucosa of the small intestine (Gray's)
SINS	Small intestine serosa	One of the delicate membranes of connective tissue which line the internal cavities of the small intestine. (Grays)

CODE	Site Name	Site Definition/Notes
SK	Skin, Epidermis	The external covering of the vertebrate body, consisting of two layers, the outer epidermis and the inner dermis.
SKL	Skull	The bones and cartilages of the vertebrate head which forms the cranium and the face.
SKM	Skeletal Muscle	the striated muscle of vertebrates that is under voluntary control (http://cancerweb.ncl.ac.uk/cgi-bin/omd?skeletal+muscle)
SL	Shell, Eggshell	The hard covering of an egg.
SLK	Silk	The silky styles on an ear of corn.
SLV	Stem to Leaves	
SM	Sperm	A mature male germ cell. (Spermatozoa)
SMT	Spermatheca	A sac in the female for receiving and storing sperm in fertilization; found in many invertebrates and certain vertebrates. (Seminal receptacle)
SN	Skeleton	The hard framework of the animal body, especially the boney framework of the body of higher vertebrate animals.
SO	Shoot	The aerial portion of a plant, including stem, branches, and leaves. A new, immature growth on a plant.
SP	Spleen	A blood-forming lymphoid organ of the circulatory system, present in most vertebrates. (McGraw-Hill)
SPB	Sphenoid bone	an irregularly shaped bone in front of the occipital in the base of the skull of the higher vertebrates. It is composed of several foetal bones which become united the adult. (Gray's)
SPI	Spine, Backbone	An articulated series of vertebrae forming the axial skeleton of the trunk and the tail. Spinal column, vertebral column
SPK	Spikelet	The compound inflorescence of a grass consisting of one or several bracteate spikes.
SPR	Sporophyte	An individual of the spore-bearing generation in plants exhibiting alteration of
SPT	Spermatid	The haploid product of the second meiotic division in spermatogenesis. Differentiate into mature spermatozoa. (Gray's)

CODE	Site Name	Site Definition/Notes
SQ	Shell (Aquatic)	A hard calcareous, outer covering on an animal body, as of bivalves and turtles.
SR	Serum	The liquid portion that remains when blood clots spontaneously and the formed and clotting elements are removed by centrifugation; it differs from plasma by the absence of fibrinogen.
SRB	Strobilus (mega-, micro-, etc.)	1) Conelike structure made up of sporophyllus or spore-bearing leaves. 2) The cone membranes of the Pinophyta
SRC	Secretory Cell	A cell that secretes a fluid.
SS	Stem/Stalk	The organ of vascular plant that usually develops branches and bears leaves and flowers.
SSC	Somatosensory center	Area of the brain that detects sensation relating to the body's superficial and deep parts
SSP	Stem plus Petioles	The stem and stock of the leaf that is attached to the stem.
ST	Soft Tissue	
STA	Setae	A slender, usually rigid bristle or hair. Also known as chaeta.
STB	Seminiferous tubules	Any of the tubercles of the testes which produce spermatozoa. (McGraw-Hill)
STE	Sternum or sternbrae	a compound ventral bone or cartilage of most vertebrates other than fishes that connects the ribs or the shoulder girdle or both and in humans consists of the manubrium, gladiolus, and xiphoid process -- called also breastbone (Webster's)
STG	Straw and grain	
STH	Straw and husk	
STL	Stolon	Horizontal branch from the base of a plant that produces new plants from buds at its tip or nodes.
STM	Striatum	The corpus striatum, a part of the brain (Websters Dictionary)
STR	Straw	
STV	Stover mature cured stalks of grain with the ears removed that are used as feed for livestock (MW online)]	

CODE	Site Name	Site Definition/Notes
SU	Stalk/Stem, Upper Half	
SV	Seminal Vesicle	A saclike, glandular diverticulum on each ductus deferens in male vertebrates; it is united with the excretory duct and serves for temporary storage of semen.
SVG	Salivary gland	Any of the saliva-secreting exocrine glands of the oral cavity. (Gray's)
SWB	Swim Bladder	A gas-filled cavity found in the body cavities of most bony fishes; has various functions in different fishes, acting as a float, a lung, a hearing aid, and a sound producing organ.
SX	Submaxillary Gland	(Submandibular gland) A large seromucous or mixed salivary gland located below the mandible on each side of the jaw.
T		
TA	Tail	1) The caudal fin of a fish or aquatic mammal. 2) The usually slender appendage that arises immediately above the anus in many vertebrates and contains the caudal vertebrae.
TB	Tibia	The larger of the two leg bones, articulating with the femur, fibula, and talus
TBC	Tubercles	A small knoblike prominence.
TCH	Trachea	The windpipe. A fibrocartilaginous tube lined with mucous membrane passing from the larynx to the bronchi. (http://cancerweb.ncl.ac.uk)
TEL	Testicle, left	The testicle located on the left side of the body
TER	Testicle, right	The testicle located on the right side of the body
TCV	Thoracic vertebrae	The segments of the vertebral column, usually twelve, which articulate with ribs to form part of the thoracic cage. Synonym: vertebrae thoracicae. (http://cancerweb.ncl.ac.uk)
TD	Transudate	A fluid that passes through the pores or interstices of a membrane.
TE	Testes	The male reproductive glands in vertebrates; after sexual maturity, the source of sperm and hormones
TF	Tuber Flesh	Tuber = The enlarged end of a rhizome in which food accumulates, as is the potato.
TG	Thigh muscle	Thigh - The upper part of the leg, from the pelvis to the knee.

CODE	Site Name	Site Definition/Notes
TH	Thorax	1) The chest; the cavity of the mammalian body between the neck and the diaphragm, containing the heart, lungs, and mediastinal structures. 2) The middle of three principal divisions of the body of certain classes of arthropods.
TI	Tissue	An aggregation of cells more or less similar morphologically and functionally.
TIL	Tillers	A shoot that develops from an axillary or adventitious bud at the base of a stem.
TK	Trunk	the main stem of a tree apart from limbs and roots or the human or animal body apart from the head and appendages (Webster's)
TLE	Trifoliolate Leaf/Leaves	A leaf consisting of three leaflets.
TLI	Thalli	Thallus = A plant body that is not differentiated into special tissue systems or organs and may vary from a single cell to a complex, branching multicellular structure.
TLM	Thalamus	Either of two large ovoid masses, consisting chiefly of gray substance, situated one on each side of and forming part of the lateral wall of the third ventricle. (Grey's on-line dictionary)
TLN	Telencephalon	the anterior subdivision of the embryonic forebrain or the corresponding part of the adult forebrain that includes the cerebral hemispheres and associated structures (Webster's)
TLS	Talus	the human tarsal bone that bears the weight of the body and that together with the tibia and fibula forms the ankle joint (Webster's)
TM	Tarsus-Metatarsus	
TMR	Tumor	An abnormal mass of tissue that results from excessive cell division that is uncontrolled and progressive, also called a neoplasm. Tumours perform no useful body function. They may be either benign (not cancerous) or malignant.
TN	Tentacles	Any of various elongate, flexible processes with tactile, prehensile, and sometimes other functions, and which are borne on the head or about the mouth of many animals.
TO	Tongue	A muscular organ located on the floor of the mouth of most vertebrates which may serve various functions, such as taking and swallowing food or tasting or as a tactile organ or sometimes as a prehensile organ.

CODE	Site Name	Site Definition/Notes
TOP	Tops (Plant)	
TOR	Torso	Portion of the body excluding the head and limbs; trunk
TP	Tuber Peeling	
TR	Tarsus	The instep of the foot consisting of the calcaneus, talus, cuboid, navicular, medial, intermediate, and lateral cuneiform bones.
TRD	Tear duct	also known as harderian or lachrymal gland, a gland on the inner side of the orbit of many animals which have a third eyelid, or nictitating membrane. (cancerweb.ncl.ac.uk)
TS	Thymus	A lymphoid organ in the neck or upper thorax of all vertebrates; it is prominent in early life and is essential for normal development of the circulating pool of lymphocytes.
TSC	Thymus cortex	The outer layer of an organ or other body structure, as distinguished from the internal substance, in this case of the Thymus. (Grays)
TSL	Tassel	The terminal male inflorescence of some plants and especially corn.
TSM	Thymus medulla	The inner portion of an organ, in this case of the thymus. (Grays)
TT	Tibiotarsus	Pertaining to the tibia and the tarsus. Tibia - shin bone Tarsus - The seven bones constituting the articulation between the foot and the leg.
TTH	Tooth, teeth	One of the bony structures supported by the jaws in mammals and by other bones in the mouth and pharynx in lower vertebrates serving principally for prehension and mastication.
TU	Tuber	Tuber = The enlarged end of a rhizome in which food accumulates, as is the potato.
TY	Thyroid	An endocrine gland found in all vertebrates that produces, stores, and secretes the thyroid hormones.
U		
UB	Urinary Bladder	A hollow organ which serves as a reservoir for urine.
UG	Uropygial Gland	A relatively large, compact, bilobed, secretory organ located at the base of the tail of most birds having a keeled sternum. Also known as oil gland.

CODE	Site Name	Site Definition/Notes
UL	Ulna	One of the bones that comprise the forearm. The largest aspect articulates with the humerus at the elbow joint and the smallest portion of the ulna articulates with the carpal bones in the wrist. (http://cancerweb.ncl.ac.uk)
ULE	Unifoliate (Primary) Leaf/Leaves	A single leaf.
UNT	Urinary tract	
UP	Urogenital papillae	Urogenital = pertaining to the urinary and genital apparatus. Papillae = A small nipple-like projection, elevation, or structure.
UR	Urine	The fluid excreted by the kidneys
URT	Ureter	The tube passing from each kidney to the bladder for the conveyance of urine. Its average length is 25 to 30 centimeters. (Gray's)
UT	Uterus	The organ of gestation in mammals which receives and retains the fertilized ovum, holds the fetus during development, and becomes the principal agent of its expulsion at term.
V		
VA	Vagina	The canal from the vulvar opening to the cervix uteri. (McGraw-Hill)
VAS	Vasculature	
VC	Visual center	Area of the brain that detects visual stimulus
VCL	Vacuole	a small cavity or space in the tissue of an organism containing air or fluid (Webster's)
VD	Vas Deferens	The portion of the excretory duct system of the testis which runs from the epididymal duct to the ejaculatory duct.
VE	Vertebra	One of the bones that make up the spine in vertebrates.
VG	Vegetative portion	WO - SD or FR
VI	Viscera	The organs within the cavities of the body of an organism
VL	Villi	villus = A fingerlike projection from the surface of a membrane.
VN	Vines	A plant whose stem requires support and which climbs by tendrils or twining or creeps along the ground; also : the stem of such a plant

CODE	Site Name	Site Definition/Notes
VNT	Ventricle	A chamber of the heart which receives blood from a corresponding atrium and from which blood is forced into the arteries (Webster's)
W		
WI	Wings	Any of the paired appendages serving organs of flight on many animals
WL	Wall, Body	
WM	White matter	Brain tissue composed of myelin-coated nerve cell fibers.
WO	Whole Organism	
Y		
YO	Yolk	The yellow spherical mass of food material that makes up the central portion of the egg of a bird or reptile.
YS	Yolk sac	a membranous sac that is attached to an embryo and encloses food yolk, that is continuous in most forms through the yolk stalk with the intestinal cavity of the embryo, that being abundantly supplied with blood vessels is throughout embryonic life and in some forms later the chief organ of nutrition, and that in placental mammals is nearly vestigial and functions chiefly prior to the elaboration of the placenta (Webster's)
Z		
ZP	Zona pellucida	Pellucid zone: a thick, transparent, noncellular layer or envelope of uniform thickness surrounding an oocyte; also called oolemma. Under a microscope it appears radially striated and is therefore also called zona radiata, zona striata or striated membrane

Appendix V. Common Keywords for Other Effects Text Field (AQUIRE only)

age efcts Alkalinity efcts Bacteria Conductivity efcts Critical Level Diet Study Depuration D.O. efcts Effluent Elimination fate Field Study Food Chain Study Genotoxicity threshold Hardness efcts Humic Acid Hypoxia efcts Ind Taxon Result in vitro Kinetics Lethal Body Burden log LC50 Metabolism metabolites Microtox Mixture nutrient study Oil Org_C efcts pH efcts Pre-Exposure Study QSAR Radiolabel Recovery Safe Conc (Safe Concentration) Salinity efcts	Sediment Sex efcts Size efcts Temperature efcts Toxicity Symptoms Transport Uptake
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Appendix W. Water Chemistry Units (AQUIRE only)

<u>Code</u>	<u>Definition</u>		
%	percent	ohm/cm	ohm per centimeter
% Sat	Percent saturation	ppm	parts per million
C	Celsius	ppm CaCO ₃	parts per million CaCO ₃
kDa	kilo Daltons	<u>Code</u>	<u>Definition</u>
F	Fahrenheit	ppm MO	parts per million Methyl Orange
K	Kelvin	ppt	parts per thousand
N	Normal	pptr	parts per trillion
NR	Not reported	S	Siemens
PSU	practical salinity units	ug/L	micrograms per liter
cm	centimeters	uS	micro Siemens
dH	degrees German hardness	uS/cm	microSiemens per centimeter
ft	feet	ueq/L	micro equivalents per liter
g CaCO ₃	grams Calcium carbonate	uM	micromolar
g/kg	grams per kilograms	umhos	micro ohms
g/L	grams per liter	umhos/cm	micro ohms per centimeter
HCO ₃	Hydrogen carbonate	umol/L	micromoles per liter
in	inches		
m	meters		
M NaCl	Molar Sodium Chloride		
mM	millimolar		
mS	milli Siemens		
mS/m	milli Siemens per meter		
mg/dm ³	milligram per cubic decimeter		
meq	milli equivalents		
meq/L	milli equivalents per liter		
mg/L	milligrams per liter		
mg/L C	milligrams per liter Carbon		
mg/L CaCO ₃	milligrams / liter Calcium carbonate		
mg/L EDTA	milligrams per liter EDTA		
mg/L FA	milligrams per liter fulvic acid		
mg/L HA	milligrams per liter Humic acid		
mg/L MO	milligrams per liter Methyl Orange		
ml/L	milliliter per liter		
ml N/100 HCl	milliliter Nitrogen per 100 Hydrochloric acid		
mm	millimeters		
mm Hg	millimeters Mercury		
mmhos	milli ohms		
mmhos/cm	milliohms per centimeter		
mmol/l	millimoles per liter		
mOsm	milliosmoles		
mS/cm	milli Siemens per centimeter		
mV	millivolts		
ohms	ohms		

Appendix X. Habitat Codes and Common Descriptors (AQUIRE only)

Code	Habitat	Definition	Descriptors
E	Estuarine	"deepwater tidal habitats... with sporadic access to open ocean...ocean water... is diluted by freshwater..."; Salinity range between 0.5-30ppt	Bay Marsh, brackish, salt, tidal Estuary Swamp
L	Lacustrine	"permanently flooded lakes and reservoirs, intermittent lakes and tidal lakes with salinity ≤ 0.5 ppt"; total area exceeds 8 ha (8 acres) and 2 m water depth.	Bay Cove Impoundment Lake
M	Marine	"open ocean overlying the continental shelf and it associated.... coastline; includes shallow coastal indentations or bays; salinity [typically] exceed ppt"	Bay Gulf Open Ocean Reef Seaweed bed
P	Palustrine	"small, shallow, permanent or intermittent fresh water bodies"; total area ≤ 8 ha (20 acres) and ≤ 2 m water depth	Bog Fen Marsh Rice fields Swamp Wetland
R	Riverine	"a channel, an open conduit either naturally or artificially created which periodically or continuously contains moving water or which forms a connecting link between two bodies of standing water" salinity ≤ 0.5 ppt	Creek River Stream Tidal River Tributary
NR	Not Reported		

Appendix Y. Substrate Codes (AQUIRE only)

Code	Definition
CL	Clay
GR	Gravel
M	Mineral
MX	Mixed substrate
MU	Mud
NR	Not Reported
O	Organic
SA	Sand
SI	Silt

Appendix Z. Depth Units

Code	Definition
NR	Not reported
cm	Centimeters
ft	Feet
in	Inches
m	Meters
mm	Millimeters

Appendix AA. Field Location Abbreviations (AQUIRE only)

Aqu	Aquatic
Agric	Agricultural
Co	County
Cr	Creek
Dev	Development
Dis	District
E ³	East
Env	Environmental
Exp	Experimental
Fish	Fisheries
Inst	Institute
Isl	Island
L	Lake
Lab	Laboratory
Natl	National
N ⁴	North
NE*	Northeast
NW*	Northwest
MT	Mountain
R	River
Res	Research
Resvr	Reservoir
S*	South
SE*	Southeast
SW	Southwest
St	Saint
Sta	Station
USFWS	United States Fish and Wildlife
Univ	University
W*	West

***Do not abbreviate directional information that is part of the proper name of a location (e.g. South L or Northwest Territory)**

Appendix BB. Geographic Text (AQUIRE only)

AF AFGHANISTAN	AL15 Mat	AG29 Oum el Bouaghi
AF01 Badakhshan	AL16 Mirdite	AG51 Relizane
AF02 Badghis	AL17 Permet	AG10 Saida
AF03 Baghlan	AL18 Pogradec	AG12 Setif
AF30 Balkh	AL19 Puke	AG30 Sidi Bel Abbes
AF05 Bamian	AL20 Sarande	AG31 Skikda
AF06 Farah	AL21 Shkoder	AG52 Souk Ahras
AF07 Faryab	AL22 Skrapar	AG53 Tamanghasset
AF08 Ghazni	AL23 Tepelene	AG33 Tebessa
AF09 Ghowr	AL28 Tirane	AG13 Tiaret
AF10 Helmand	AL26 Tropoje	AG54 Tindouf
AF11 Herat	AL27 Vlore	AG55 Tipaza
AF31 Jowzjan		AG56 Tissemsilt
AF13 Kabul	AG ALGERIA	AG14 Tizi Ouzou
AF23 Kandahar	AG34 Adrar	AG15 Tlemcen
AF13 Kapisa	AG35 Ain Defla	
AF15 Konar	AG36 Ain Temouchent	AQ AMERICAN SAMOA
AF24 Kondoz	AG01 Alger	
AF16 Laghman	AG37 Annaba	AN ANDORRA
AF17 Lowgar	AG03 Batna	AN01 Andorra
AF18 Nangarhar	AQ38 Bechar	AN02 Canillo
AF19 Nimruz	AG18 Bejaia	AN03 Encamp
AF20 Oruzgan	AG19 Biskra	AN04 La Massana
AF21 Paktia	AG20 Blida	AN05 Ordino
AF22 Paktika	AG39 Bordj Bou Arreridj	An06 Sant Julia de Loria
AF22 Parvan	AG21 Bouira	
AF32 Samangan	AG40 Boumerdes	AO ANGOLA
AF33 Sar-e Pol	AG41 Chlef	AO19 Bengo
AF26 Takhar	AG04 Constantine	AO01 Benguela
AF27 Vardak	AG22 Djelfa	AO02 Bie
AF28 Zabol	AG42 El Bayadh	AO03 Cabinda
	AG43 El Oued	AO04 Cuando Cubango
AL ALBANIA	AG44 El Tarf	AO05 Cuanza Norte
AL01 Berat	AG45 Ghardaia	AO06 Cuanza Sul
AL02 Dibre	AG23 Guelma	AO07 Cunene
AL03 Durres	AG46 Illizi	AO08 Huambo
AL04 Elbasan	AG24 Jijel	AO09 Huila
AL05 Fier	AG47 Khenchela	AO20 Luanda
AL06 Gjirokaster	AG25 Laghouat	AO17 Lunda Norte
AL07 Gramsh	AG26 Mascara	AO18 Lunda Sul
AL08 Kolonje	AG06 Medea	AO12 Malanje
AL09 Korce	AG48 Mila	AO14 Moxico
AL10 Kruje	AG07 Mostaganem	AO15 Uige
AL11 Kukës	AG27 M'sila	AO16 Zaire
AL12 Lezhe	AG49 Naama	
AL13 Librazhd	AG09 Oran	AV ANGUILLA
AL14 Lushnje	AG50 Ouargla	

AY ANTARCTICA

AC ANTIGUA AND
BARBUDA

AC01 Barbuda
AC03 Saint George
AC04 Saint John
AC05 Saint Mary
AC06 Saint Paul

AC07 Saint Peter
AC08 Saint Philip

AR ARGENTINA

AC01 Buenos Aires
AC02 Catamarca
AR03 Chaco
AR04 Chubut
AR05 Cordoba
AR06 Corrientes
AR07 Distrito Federal
AR08 Entre Rios
AR09 Formosa
AR10 Jujuy
AR11 La Pampa
AR12 La Rioja
AR13 Mendoza
AR14 Misiones
AR15 Neuquen
AR16 Rio Negro
AR17 Salta
AR18 San Juan
AR19 San Luis
AR20 Santa Cruz
AR21 Santa Fe
AR22 Santiago del Estero
AR23 Tierra del Fuego,
Antartidae Islas del
Atlantico Sur
AR24 Tucuman

AM ARMENIA

AA ARUBA

AT ASHMORE AND
CARTIER ISLANDS

* AS AUSTRALIA

AS01 Australian Capital
Territory
AS02 New South Wales
AS03 Northern Territory
AS04 Queensland
AS05 South Australia
AS06 Tasmania
AS07 Victoria
AS08 Western Australia

AU AUSTRIA

AU01 Burgenland
AU02 Karnten
AU03 Niederosterreich
AU04 Oberosterreich
AU05 Salzburg
AU06 Steiermark
AU07 Tirol
AU08 Vorarlberg
AU09 Wien

AJ AZERBAIJAN

BF BAHAMAS, THE

BF24 Acklins and Crooked
Islands
BF05 Bimini
BF06 Cat Island
BF10 Exuma
BF25 Freeport
BF26 Fresh Creek
BF27 Governor's Harbour
BF28 Green Turtle Cay
BF22 Harbour Island
BF29 High Rock
BG13 Inagua
BF30 Kemps Bay
BF15 Long Island

BF31 Marsh Harbour
BF16 Mayaguana
BF23 New Providence
BF32 Nichollstown and Berry
Islands
BF18 Ragged Island
BF33 Rock Sound
BF34 Sandy Point
BF35 San Salvador and Rum
Cay

BA BAHRAIN

BA01 Al Hadd
BA02 Al Manamah
BA08 Al Mintaqah al
Gharbiyah
BA11 Al Mintaqah al Wusta
BA10 Al Mintaqah ash
Shamaliyah
BA03 Al Muharraq
BA13 Ar Rifa` wa al Mintaqah
al Janubiyah
BA05 Jidd Hafs
BA14 Madinat Hamad
BA12 Madinat `Isa
BA09 Mintaqat Juzur Hawar
BA06 Sitrah

FQ BAKER ISLAND

BG BANGLADESH

BG22 Bagerhat
BG04 Bandarban
BG25 Barguna
BG01 Barisal
BG23 Bhola
BG24 Bogra
BG26 Brahmanbaria
BG27 Chandpur

BG28 Chapai Nawabganj	BG73 Shariyatpur	BN05 Oueme
BG29 Chattagram	BG74 Sherpur	BN06 Zou
BG30 Chuadanga	BG75 Sirajganj	
BG05 Comilla	BG76 Sunamganj	BD BERMUDA
BG31 Cox's Bazar	BG77 Sylhet	BD01 Devonshire
BG32 Dhaka	BG78 Tangail	BD03 Hamilton
BG33 Dinajpur	BG79 Thakurgaon	BD03 Hamilton
BG34 Faridpur		BD04 Paget
BG35 Feni	BB BARBADOS	BD05 Pembroke
BG36 Gaibandha	BB01 Christ Church	BD06 Saint George
BG37 Gazipur	BB02 Saint Andrew	BD07 Saint George's
BG38 Gopalganj	BB03 Saint George	BD08 Sandys
BG39 Habiganj	BB04 Saint James	BD09 Smiths
BG40 Jaipurhat	BB05 Saint John	BD10 Southampton
BG41 Jamalpur	BB06 Saint Joseph	BD11 Warwick
BG42 Jessore	BB07 Saint Lucy	
BG43 Jhalakati	BB08 Saint Michael	BT BHUTAN
BG44 Jhenaidah	BB09 Saint Peter	BT05 Bumthang
BG45 Khagrachari	BB10 Saint Philip	BT06 Chhukha
BG46 Khulna	BB11 Saint Thomas	BT07 Chirang
BG47 Kishorganj		BT08 Daga
BG48 Kurigram	BS BASSAS DA INDIA	BT09 Geylegphug
BG49 Kushtia		BT10 Ha
BG50 Laksmipur	BO BELARUS	BT11 Lhuntshi
BG51 Lalmonirhat		BT12 Mongar
BG52 Madaripur	BE BELGIUM	BT13 Paro
BG53 Magura	BE01 Antwerpen	BT14 Pemagatsel
BG54 Manikganj	BE02 Brabant	BT15 Punakha
BG55 Meherpur	BE03 Hainaut	BT16 Samchi
BG56 Moulavibazar	BE04 Liege	BT17 Samdrup
BG57 Munshiganj	BE05 Limburg	BT18 Shemgang
BG12 Mymensingh	BE06 Luxembourg	BT19 Tashigang
BG58 Naogaon	BE07 Namur	BT20 Thimphu
BG59 Narail	BE08 Oost-Vlaanderen	BT21 Tongsa
BG60 Narayanganj	BE09 West-Vlaanderen	BT22 Wangdi Phodrang
BG61 Narsingdi		
BG62 Nator	BH BELIZE	BL BOLIVIA
BG63 Netrakona	BH01 Belize	BL01 Chuquisaca
BG64 Nilphamari	BH02 Cayo	BL02 Cochabamba
BG13 Noakhali	BH03 Corozal	BL03 El Beni
BG65 Pabna	BH04 Orange Walk	BL04 La Paz
BG66 Panchagar	BH05 Stann Creek	BL05 Oruro
BG67 Parbattya Chattagram	BH06 Toledo	BL06 Pando
BG15 Patuakhali		BL07 Potosi
BG68 Pirojpur	BN BENIN	BL08 Santa Cruz
BG69 Rajbari	BN01 Atakora	BL09 Tarija
BG70 Rajshahi	BN02 Atlantique	
BG71 Rangpur	BN03 Borgou	BK BOSNIA AND
BG72 Satkhira	BN04 Mono	HERZEGOVINA

* BC BOTSWANA	BX BRUNEI	BM02 Chin State
BC01 Central	BX01 Belait	BM03 Irrawaddy
BC02 Chobe	BX02 Brunei and Muara	BM04 Kachin State
BC03 Ghanzi	BX03 Temburong	BM05 Karan State
BC04 Kgalagadi	BX04 Tutong	BM06 Kayah State
BC05 Kgatleng		BM07 Magwe
BC06 Kweneng	BU BULGARIA	BM08 Mandalay
BC07 Ngamiland	BU29 Burgas	BM13 Mon State
BC08 North-East	BU30 Grad Sofiya	BM09 Pegu
BC09 South-East	BU31 Khaskovo	BM01 Rakhine State
BC10 Southern	BU32 Lovech	BM14 Rangoon
	BU33 Mikhaylovgrad	BM10 Sagaing
BV BOUVET ISLAND	BU34 Plovdiv	BM11 Shan State
	BU35 Razgrad	BM12 Tenasserim
	BU36 Sofiya	
* BR BRAZIL	BU37 Varna	BY BURUNDI
BR01 Acre		BY09 Bubanza
BR02 Alagoas	* UV BURKINA	BY02 Bujumbura
BR03 Amapa	UV15 Bam	BY10 Bururi
BR04 Amazonas	UV16 Bazega	BY11 Cankuzo
BR05 Bahia	UV17 Bougouriba	BY12 Cibitoke
BR06 Ceara	UV18 Boulgou	BY13 Gitega
BR07 Distrito Federal	UV19 Boulkiemde	BY14 Karuzi
BR08 Espirito Santo	UV20 Ganzourgou	BY15 Kayanza
BR29 Goias	UV21 Gnagna	BY16 Kirundo
BR13 Maranhao	UV22 Gourma	BY17 Makamba
BR14 Mato Grosso	UV23 Houet	BY05 Muramvya
BR11 Mato Grosso do Sul	UV24 Kadiogo	BY18 Muyinga
BR15 Minas Gerais	UV25 Kenedougou	BY19 Ngozi
BR16 Para	UV26 Komoe	BY20 Rutana
BR17 Paraiba	UV27 Kossi	BY21 Ruyigi
BR18 Parana	UV28 Kouritenga	
BR30 Pernambuco	UV29 Mouhoun	CB CAMBODIA
BR20 Piaui	UV30 Namentenga	CB01 Batdambang
BR21 Rio de Janeiro	UV31 Naouri	CB02 Kampong Cham
BR22 Rio Grande do Norte	UV32 Oubritenga	CB03 Kampong Chhnang
BR23 Rio Grande do Sul	UV33 Oudalan	CB04 Kampong Spoe
BR24 Rondonia	UV34 Passore	CB05 Kampong Thum
BR25 Roraima	UV35 Poni	CB06 Kampot
BR26 Santa Catarina	UV36 Sanguie	CB07 Kandal
BR27 Sao Paulo	UV37 Sanmatenga	CB08 Kaoh Kong
BR28 Sergipe	UV38 Seno	CB09 Kracheh
BR31 Tocantins	UV39 Sissili	CB10 Mondol Kiri
	UV40 Soum	CB11 Phnum Penh
IO BRITISH INDIAN OCEAN TERRITORY	UV41 Sourou	CB12 Pouthisat
	UV42 Tapoa	CB13 Preah Vihear
VI BRITISH VIRGIN ISLANDS	UV43 Yatenga	CB14 Prey Veng
	UV44 Zoundweogo	CB15 Rotanakiri
	BM BURMA	CB16 Siemreab-Otdar

Meanchey	CJ04 South Town	CI07 Coquimbo
CB17 Stoeng Treng	CJ05 Spot Bay	CI08 Libertador General
CB18 Svay Rieng	CJ06 Stake Bay	Bernardo O'Higgins
CB19 Takev	CJ07 West End	CI09 Los Lagos
	CJ08 Western	CI10 Magallanes y de la
* CM CAMEROON		Antartica Chilena
CM10 Adamaoua	CT CENTRAL AFRICAN	CI11 Maule
CM11 Centre	REPUBLIC	CI12 Region Metropolitana
CM04 Est	CT01 Bamingui-Bangoran	CI13 Tarapaca
CM12 Extreme-Nord	CT18 Bangui	Valparaiso
CM05 Littoral	CT02 Basse-Kotto	
CM13 Nord	CT15 Gribingui	* CH CHINA
CM07 Nord-Ouest	CT03 Haute-Kotto	CH01 Anhui
CM08 Ouest	CT04 Haute-Sangha	CH22 Beijing
CM14 Sud	CT05 Haut-Mbomou	CH07 Fujian
CM09 Sud-Ouest	CT06 Kemo-Gribingui	CH15 Gansu
	CT07 Lobaye	CH30 Guangdong
* CA CANADA	CT08 Mbomou	CH16 Guangxi
* CA01 Alberta	CT09 Nana-Mambere	CH18 Guizhou
* CA02 British Columbia	CT17 Ombella-Mpoko	CH31 Hainan
* CA03 Manitoba	CT11 Ouaka	CH10 Hebei
* CA04 New Brunswick	CT12 Ouham	CH08 Heilongjiang
* CA05 Newfoundland	CT13 Ouham-Pende	CH09 Henan
* CA06 Northwest Territories	CT16 Sangha	CH12 Hubei
* CA07 Nova Scotia	CT14 Vakaga	CH11 Hunan
* CA08 Ontario		CH04 Jiangsu
* CA09 Prince Edward Island	CD CHAD	CH03 Jiangxi
* CA10 Quebec	CD01 Batha	CH05 Jilin
* CA11 Saskatchewan	CD02 Biltine	CH19 Liaoning
* CA12 Yukon Territory	CD03 Borkou-Ennedi-Tibesti	CH20 Nei Mongol
	CD04 Chari-Baguirmi	CH21 Ningxia
CV CAPE VERDE	CD05 Guera	CH06 Qinghai
CV01 Boa Vista	CD06 Kanem	CH26 Shaanxi
CV02 Brava	CD07 Lac	CH25 Shandong
CV03 Fogo	CD08 Logone Occidental	CH23 Shanghai
CV04 Maio	CD09 Logone Oriental	CH24 Shanxi
CV05 Paul	CD10 Mayo-Kebbi	CH27 Sichuan
CV06 Praia	CD11 Moyen-Chari	CH28 Tianjin
CV07 Ribeira Grande	CD12 Ouaddai	CH13 Xinjiang
CV08 Sal	CD13 Salamat	CH14 Xizang
CV09 Santa Catarina	CD14 Tandjile	CH29 Yunnan
CV10 Sao Nicolau		CH02 Zhejiang
CV11 Sao Vicente	CI CHILE	
CV12 Tarrafal	CI02 Aisen del General	KT CHRISTMAS ISLAND
	Carlos Ibanez del Campo	
CJ CAYMAN ISLANDS	CI03 Antofagasta	IP CLIPPERTON ISLAND
CJ01 Creek	CI04 Araucania	
CJ02 Eastern	CI05 Atacama	CK COCOS (KEELING)
CJ03 Midland	CI06 Bio-Bio	ISLANDS

CO COLOMBIA	CF07 Niari	IV48 Mbahiakro
CO01 Amazonas	CF08 Plateaux	IV23 Odienne
CO02 Antioquia	CF11 Pool	IV31 Oume
CO03 Arauca	CF10 Sangha	IV49 Sakassou
CO04 Atlantico		IV50 San Pedro
CO35 Bolivar	CW COOK ISLANDS	IV51 Sassandra
CO36 Boyaca	CR CORAL SEA ISLANDS	IV25 Seguela
CO37 Caldas		IV52 Sinfra
CO08 Caqueta	CS COSTA RICA	IV32 Soubre
CO32 Casanare	CS01 Alajuela	IV53 Tabou
CO09 Cauca	CS02 Cartago	IV54 Tanda
CO10 Cesar	CS03 Guanacaste	IV55 Tiassale
CO11 Choco	CS04 Heredia	IV33 Tingrela
CO12 Cordoba	CS06 Limon	IV26 Touba
CO33 Cundinamarca	CS07 Puntarenas	IV56 Toumodi
CO34 Distrito Especial	CS08 San Jose	IV57 Vavoua
CO15 Guainia	IV COTE D'IVOIRE	IV58 Yamoussoukro
CO14 Guaviare	IV01 Abengourou	IV34 Zuenoula
CO16 Huila	IV35 Abidjan	
CO17 La Guajira	IV04 Aboisso	HR CROATIA
CO38 Magdalena	IV05 Adzope	
CO19 Meta	IV06 Agboville	CU CUBA
CO20 Narino	IV36 Bangolo	CU05 Camaguey
CO21 Norte de Santander	IV37 Beoumi	CU07 Ciego de Avila
CO22 Putumayo	IV07 Biankouma	CU08 Cienfuegos
CO23 Quindio	IV38 Bondoukou	CU02 Ciudad de la Habana
CO24 Risaralda	IV27 Bongouanou	CU09 Granma
CO25 San Andres y	IV39 Bouafle	CU10 Guantanamo
Providencia	IV40 Bouake	CU12 Holguin
CO26 Santander	IV11 Bouna	CU04 Isla de la Juventud
CO27 Sucre	IV12 Boundiali	CU11 La Habana
CO28 Tolima	IV03 Dabakala	CU13 Las Tunas
CO29 Valle del Cauca	IV41 Daloa	CU03 Matanzas
CO30 Vaupes	IV14 Danane	CU01 Pinar del Rio
CO31 CVichada	IV42 Daoukro	CU14 Sancti Spiritus
	IV43 Dimbokro	CU15 Santiago de Cuba
CN COMOROS	IV16 Divo	CU16 Villa Clara
CN01 Anjouan	IV44 Duekoue	
CN02 Grande Comore	IV17 Ferkessedougou	CY CYPRUS
CN03 Moheli	IV18 Gagnoa	CY01 Famagusta
	IV45 Grand-Lahou	CY02 Kyrenia
CF CONGO	IV46 Guiglo	CY03 Larnaca
CF01 Bouenza	IV28 Issia	CY05 Limassol
CF12 Brazzaville	IV20 Katiola	CY04 Nicosia
CF03 Cuvette	IV21 Korhogo	CY06 Paphos
CF04 Kouilou	IV29 Lakota	
CF05 Lekoumou	IV47 Man	* EZ CZECH REPUBLIC
CF06 Likouala	IV30 Mankono	* DA DENMARK

DA01 Arhus	DR30 La Vega	EG07 Al Isma'iliyah
DA02 Bornholm	DR14 Maria Trinidad Sanchez	EG08 Al Jizah
DA03 Frederiksborg	DR31 Monsenor Nouel	EG09 Al Minufiyah
DA04 Fyn	DR15 Monte Cristi	EG10 Al Minya
DA05 Kobenhavn	DR32 Monte Plata	EG11 Al Qahirah
DA07 Nordjylland	DR16 Pedernales	EG12 Al Qalyubiyah
DA08 Ribe	DR17 Peravia	EG13 Al Wadi al Jadid
DA09 Ringkobing	DR18 Puerto Plata	EG14 Ash Sharqiyah
DA10 Roskilde	DR19 Salcedo	EG15 As Suways
DA11 Sonderjylland	DR20 Samana	EG16 Aswan
DA06 Staden Kobenhavn	DR21 Sanchez Ramirez	EG17 Asyut
DA12 Storstrom	DR33 San Cristobal	EG18 Bani Suwayf
DA13 Vejle	DR23 San Juan	EG19 Bur Sa'id
DA14 Vestsjælland	DR24 San Pedro De Macoris	EG20 Dumyat
DA15 Viborg	DR25 Santiago	EG26 Janub Sina'
DJ DJIBOUTI	DR26 Santiago Rodriguez	EG21 Kafr ash Shaykh
DJ01 `Ali Sabih	DR27 Valverde	EG22 Matruh
DJ02 Dikhil		EG23 Qina
DJ03 Djibouti	EC ECUADOR	EG27 Shamal Sina'
DJ04 Obock	EC02 Azuay	EG24 Suhaj
DJ05 Tadjoura	EC03 Bolivar	
DO DOMINICA	EC04 Canar	ES EL SALVADOR
DO02 Saint Andrew	EC05 Carchi	ES01 Ahuachapan
DO03 Saint David	EC06 Chimborazo	ES02 Cabanas
DO04 Saint George	EC07 Cotopaxi	ES03 Chalatenango
DO05 Saint John	EC08 El Oro	ES04 Cuscatlan
DO06 Saint Joseph	EC09 Esmeraldas	ES05 La Libertad
DO07 Saint Luke	EC01 Galapagos	ES06 La Paz
DO08 Saint Mark	EC10 Guayas	ES07 La Union
DO09 Saint Patrick	EC11 Imbabura	ES08 Morazan
DO10 Saint Paul	EC12 Loja	ES09 San Miguel
DO11 Saint Peter	EC13 Los Rios	ES10 San Salvador
DR DOMINICAN REPUBLIC	EC14 Manabi	ES11 Santa Ana
DR01 Azua	EC15 Morona-Santiago	ES12 San Vicente
DR02 Baoruco	EC21 Napo	ES13 Sonsonate
DR03 Barahona	EC17 Pastaza	ES14 Usulután
DR04 Dajabon	EC18 Pichincha	
DR05 Distrito Nacional	EC22 Sucumbios	EK EQUATORIAL GUINEA
DR06 Duarte	EC19 Tungurahua	EK03 Annobon
DR11 Elias Pina	EC20 Zamora-Chinchipe	EK04 Bioko Norte
DR28 El Seibo	* EG EGYPT	EK05 Bioko Sur
DR08 Espaillat	EG01 Ad Daqahliyah	EK06 Centro Sur
DR29 Hato Mayor	EG02 Al Bahr al Ahmar	EK07 Kie-Ntem
DR09 Independencia	EG03 Al Buhayrah	EK08 Litoral
DR10 La Altagracia	EG04 Al Fayyum	EK09 Wele-Nzas
DR12 La Romana	EG05 Al Gharbiyah	
	EG06 Al Iskandariyah	ER ERITREA
		EN ESTONIA

EN01	Harjumaa	ET37	Tigray
EN02	Hiiumaa	ET43	Welega
EN03	Ida-Virumaa		
EN04	Jarvamaa	EU	EUROPA ISLAND
EN05	Jogevamaa		
EN06	Kohtla-Jarve		
EN07	Laanemaa		
EN08	Laane-Virumaa		
EN09	Narva		
EN10	Parnu		
EN11	Parnumaa		
EN12	Polvamaa		
EN13	Raplamaa		
EN14	Saaremaa		
EN15	Sillamae		
EN16	Tallinn		
EN17	Tartu		
EN18	Tartumaa		
EN19	Valgamaa		
EN20	Viljandimaa		
EN21	Vorumaa		

ET ETHIOPIA

ET15	Adis Abeba
ET01	Arsi
ET17	Asosa
ET38	Bale
ET18	Borena
ET19	Debub Gonder
ET20	Debub Shewa
ET21	Debub Welo
ET22	Dire Dawa
ET23	Gambela
ET39	Gamo Gofa
ET40	Ilubabor
ET41	Kefa
ET24	Metekel
ET25	Mirab Gojam
ET26	Mirab Harerge
ET27	Mirab Shewa
ET28	Misrak Gojam
ET29	Misrak Harerge
ET30	Nazret
ET31	Ogaden
ET32	Omo
ET33	Semen Gonder
ET34	Semen Shewa
ET35	Semen Welo
ET42	Sidamo

FK FALKLAND ISLANDS (ISLAS MALVINAS)	FRB3 Midi-Pyrenees	GM06 Niedersachsen
	FRB4 Nord-Pas-de-Calais	GM07 Nordrhein-Westfalen
	FRB5 Pays de la Loire	GM08 Rheinland-Pfalz
FO FAROE ISLANDS	FRB6 Picardie	GM09 Saarland
	FRB7 Poitou-Charentes	GM13 Sachsen
FM FEDERATED STATES OF MICRONESIA	FRB8 Provence-Alpes-Cote d'Azur	GM14 Sachsen-Anhalt
FM03 Chuuk	FRB9 Rhone-Alpes	GM10 Schleswig-Holstein
FM01 Kosrae		GM15 Thuringen
FM02 Pohnpei		
FM04 Yap		
	FG FRENCH GUIANA	* GH GHANA
FJ FIJI		GH02 Ashanti
FJ01 Central	FP FRENCH POLYNESIA	GH03 Brong-Ahafo
FJ02 Eastern		GH04 Central
FJ03 Northern	FS FRENCH SOUTHERN AND ANTARCTIC LANDS	GH05 Eastern
FJ04 Rotuma		GH01 Greater Accra
FJ05 Western		GH06 Northern
	GB GABON	GH10 Upper East
* FI FINLAND	GB01 Estuaire	GH11 Upper West
FI01 Ahvenanmaa	GB02 Haut-Ogooue	GH08 Volta
FI02 Hame	GB03 Moyen-Ogooue	GH09 Western
FI03 Keski-Suomi	GB04 Ngounie	
FI04 Kuopio	GB05 Nyanga	GI GIBRALTAR
FI05 Kymi	GB06 Ogooue-Ivindo	
FI06 Lappi	GB07 Ogooue-Lolo	GO GLORIOSO ISLANDS
FI07 Mikkeli	GB08 Ogooue-Maritime	
FI08 Oulu	GB09 Woleu-Ntem	GR GREECE
FI09 Pohjois-Karjala F110 Turku ja Pori	GA GAMBIA, THE	GR31 Aitolia kai Akarnania
FI11 Uusimaa	GA01 Banjul	GR38 Akhaia
FI12 Vaasa	GA02 Lower River	GR36 Argolis
	GA03 MacCarthy Island	GR41 Arkadhia
	GA07 North Bank	GR20 Arta
	GA04 Upper River	GR35 Attiki
	GA05 Western	GR47 Dhodhekanisos
* FR FRANCE		GR04 Drama
FRC1 Alsace	GZ GAZA STRIP	GR30 Evritania
FR97 Aquitaine		GR01 Evros
FR98 Auvergne	GG GEORGIA	GR34 Evvoia
FR99 Basse-Normandie		GR08 Florina
FRA1 Bourgogne		GR32 Fokis
FRA2 Bretagne	* GM GERMANY	GR29 Fthiotis
FRA3 Centre	GM01 Baden-Wurtemberg	GR10 Grevena
FRA4 Champagne-Ardenne	GM02 Bayern	GR39 Ilia
FRA5 Corse	GM16 Berlin	GR12 Imathia
FRA6 Franche-Comte	GM11 Brandenburg	GR17 Ioannina
FRA7 Haute-Normandie	GM03 Bremen	GR45 Iraklion
FRA8 Ile-de-France	GM04 Hamburg	GR23 Kardhitsa
FRA9 Languedoc-Roussillon	GM05 Hessen	GR09 Kastoria
FRB1 Limousin	GM12	GR14 Kavala
FRB2 Lorraine	Mecklenburg-Vorpommern	GR27 Kefallinia

GR25 Kerkira	GT03 Chimaltenango	GV26 Siguiri
GR15 Khalkidhiki	GT04 Chiquimula	GV27 Telimele
GR43 Khandia	GT05 El Progreso	GV28 Tougue
GR50 Khios	GT06 Escuintla	GV29 Yomou
GR49 Kikladhes	GT07 Guatemala	
GR06 Kilkis	GT08 Huehuetenango	PU GUINEA-BISSAU
GR37 Korinthia	GT09 Izabal	PU01 Bafata
GR11 Kozani	GT10 Jalapa	PU12 Biombo
GR42 Lakonia	GT11 Jutiapa	PU11 Bissau
GR21 Larisa	GT12 Peten	PU05 Bolama
GR46 Lasithi	GT14 Quiche	PU06 Cacheu
GR51 Lesvos	GT13 Quetzaltenango	PU10 Gabu
GR26 Levkas	GT15 Retalhuleu	PU04 Oio
GR24 Magnisia	GT16 Sacatepequez	PU02 Quinara
GR40 Messinia	GT17 San Marcos	PU07 Tombali
GR07 Pella	GT18 Santa Rosa	
GR16 Pieria	GT19 Solola	GY GUYANA
GR19 Preveza	GT20 Suchitepequez	GY10 Barima-Waini
GR44 Rethimni	GT21 Totonicapan	GY11 Cuyuni-Mazaruni
GR02 Rodhopi	GT22 Zacapa	GY12 Demerara-Mahaica
GR48 Samos		GY13 East
GR05 Serrai	GK GUERNSEY	Berbice-Corentyne
GR18 Thesprotia		GY14 Essequibo
GR13 Thessaloniki	GV GUINEA	Islands-West Demerara
GR22 Trikala	GV01 Beyla	GY15 Mahaica-Berbice
GR33 Voiotia	GV02 Boffa	GY16 Pomeroon-Supenaam
GR03 Xanthi	GV03 Boke	GY17 Potaro-Siparuni
GR28 Zakynthos	GV04 Conakry	GY18 Upper
	GV05 Dabola	Demerara-Berbice
GL GREENLAND	GV06 Dalaba	GY19 Upper Takutu-Upper
GL01 Nordgronland	GV07 Dinguiraye	Essequibo
GL02 Ostgronland	GV08 Dubreka	
GL03 Vestgronland	GV09 Faranah	HA HAITI
	GV10 Forecariah	HA06 Artibonite
GJ GRENADA	GV11 Fria	HA07 Centre
GJ01 Saint Andrew	GV12 Gaoual	HA08 Grand' Anse
GJ02 Saint David	GV13 Gueckedou	HA09 Nord
GJ03 Saint George	GV14 Kankan	HA10 Nord-Est
GJ04 Saint John	GV15 Kerouane	HA03 Nord-Ouest
GJ05 Saint Mark	GV16 Kindia	HA11 Ouest
GJ06 Saint Patrick	GV17 Kissidougou	HA12 Sud
	GV18 Koundara	HA13 Sud-Est
GP GUADELOUPE	GV19 Kouroussa	
	GV20 Labe	HM HEARD ISLAND AND
GQ GUAM	GV21 Macenta	MCDONALD
	GV22 Mali	ISLANDS
GT GUATEMALA	GV23 Mamou	
GT01 Alta Verapaz	GV24 Nzerekore	HO HONDURAS
GT02 Baja Verapaz	GV25 Pita	HO01 Atlantida

HO02 Choluteca	HU17 Somogy	IC31 Sudur-Mulasysla
HO03 Colon	HU34 Sopron	IC32 Sudur-Tingeyjarsysla
HO04 Comayagua	HU18	IC33 Vestmannaeyjar
HO05 Copan	Szabolcs-Szatmar-Bereg	IC34
HO06 Cortes	HU19 Szeged	Vestur-Bardastrandarsysla
HO07 El Paraiso	HU35 Szekesfehervar	IC35 Vestur-Hunavatnssysla
HO08 Francisco Morazan	HU36 Szolnok	IC36 Vestur-Isafjardarsysla
HO09 Gracias a Dios	HU37 Szombathely	IC37 Vestur-Skaftafellssysla
HO10 Intibuca	HU38 Tatabanya	
HO11 Islas de la Bahia	HU21 Tolna	* IN INDIA
HO12 La Paz	HU22 Vas	IN01 Andaman and Nicobar
HO13 Lempira	HU23 Veszprem	Islands
HO14 Ocotepeque	HU39 Veszprem	IN02 Andhra Pradesh
HO15 Olancho	HU24 Zala	IN30 Arunachal Pradesh
HO16 Santa Barbara	HU40 Zalaegerszeg	IN03 Assam
HO17 Valle		IN04 Bihar
HO18 Yoro	IC ICELAND	IN05 Chandigarh
	IC01 Akranes	IN06 Dadra and Nagar Haveli
HK HONG KONG	IC02 Akureyri	IN32 Daman and Diu
	IC03 Arnessysla	IN07 Delhi
HQ HOWLAND ISLAND	IC04	IN33 Goa
	Austur-Bardastrandarsysla	IN09 Gujarat
* HU HUNGARY	IC05 Austur-Hunavatnssysla	IN10 Haryana
HU01 Bacs-Kiskun	IC06 Austur-Skaftafellssysla	IN11 Himachal Pradesh
HU02 Baranya	IC07 Borgarfjardarsysla	IN12 Jammu and Kashmir
HU03 Bekes	IC08 Dalasysla	IN19 Karnataka
HU26 Bekescsaba	IC09 Eyjafjardarsysla	IN13 Kerala
HU04 Borsod-Abauj-Zemlen	IC10 Gullbringusysla	IN14 Lakshadweep
HU05 Budapest	IC11 Hafnarfjordur	IN15 Madhya Pradesh
HU06 Csongrad	IC12 Husavik	IN16 Maharashtra
HU07 Debrecen	IC13 Isafjordur	IN17 Manipur
HU27 Dunaujvaros	IC14 Keflavik	IN18 Meghalaya
HU28 Eger	IC15 Kjosarsysla	IN31 Mizoram
HU08 Fejer	IC16 Kopavogur	IN20 Nagaland
HU25 Gyor	IC17 Myrasysla	IN21 Orissa
HU09 Gyor-Moson-Sopron	IC18 Neskaupstadur	IN22 Pondicherry
HU10 Hajdu-Bihar	IC19 Nordur-Isafjardarsysla	IN23 Punjab
HU11 Heves	IC20 Nordur-Mulasysla	IN24 Rajasthan
HU29 Hodmezovasarhely	IC21 Nordur-Tingeyjarsysla	IN29 Sikkim
HU20 Jasz-Nagykun-Szolnok	IC22 Olafsfjordur	IN25 Tamil Nadu
HU30 Kaposvar	IC23 Rangarvallasysla	IN26 Tripura
HU31 Kecskemet	IC24 Reykjavik	IN27 Uttar Pradesh
HU12 Komarom-Esztergom	IC25 Saudarkrokur	IN28 West Bengal
HU13 Miskolc	IC26 Seydisfjordur	
HU32 Nagykanizsa	IC27 Siglufjordur	ID INDONESIA
HU14 Nograd	IC28 Skagafjardarsysla	ID01 Aceh
HU33 Nyiregyhaza	IC29 Snafellsnes- og	ID02 Bali
HU15 Pecs	Hnappadalssysla	ID03 Bengkulu
HU16 Pest	IC30 Strandarsysla	ID09 Irian Jaya

ID04 Jakarta Raya	IR31 Yazd	EI31 Wicklow
ID05 Jambi	IR27 Zanjan	
ID06 Jawa Barat		* IS ISRAEL
ID07 Jawa Tengah	IZ IRAQ	IS01 HaDarom
ID08 Jawa Timur	IZ01 Al Anbar	IS02 HaMerkaz
ID11 Kalimantan Barat	IZ02 Al Basrah	IS03 HaZafon
ID12 Kalimantan Selatan	IZ03 Al Muthanna	IS04 Hefa
ID13 Kalimantan Tengah	IZ04 Al Qadisiyah	IS05 Tel Aviv
ID14 Kalimantan Timur	IZ17 An Najaf	IS06 Yerushalayim
ID15 Lampung	IZ11 Arbil	
ID16 Maluku	IZ05 As Sulaymaniyah	* IT ITALY
ID17 Nusa Tenggara Barat	IZ13 At Ta'mim	IT01 Abruzzi
ID18 Nusa Tenggara Timur	IZ06 Babil	IT02 Basilicata
ID19 Riau	IZ07 Baghdad	IT03 Calabria
ID20 Sulawesi Selatan	IZ08 Dahuk	IT04 Campania
ID21 Sulawesi Tengah	IZ09 Dhi Qar	IT05 Emilia-Romagna
ID22 Sulawesi Tenggara	IZ10 Diyala	IT06 Friuli-Venezia Giulia
ID23 Sulawesi Utara	IZ12 Karbala'	IT07 Lazio
ID24 Sumatera Barat	IZ14 Maysan	IT08 Liguria
ID25 Sumatera Selatan	IZ15 Ninawa	IT09 Lombardia
ID26 Sumatera Utara	IZ18 Salah ad Din	IT10 Marche
ID27 Timor Timur	IZ16 Wasit	IT11 Molise
ID10 Yogyakarta		IT12 Piemonte
	EI IRELAND	IT13 Puglia
* IR IRAN	EI01 Carlow	IT14 Sardegna
IR01 Azarbayjan-e Bakhtari	EI02 Cavan	IT15 Sicilia
IR02 Azarbayjan-e Khavari	EI03 Clare	IT16 Toscana
IR13 Bakhtaran	EI04 Cork	IT17 Trentino-Alto Adige
IR22 Bushehr	EI06 Donegal	IT18 Umbria
IR03 Chahar Mahall va	EI07 Dublin	IT19 Valle d'Aosta
Bakhtiari	EI10 Galway	IT20 Veneto
IR28 Esfahan	EI11 Kerry	
IR07 Fars	EI12 Kildare	* JM JAMAICA
IR08 Gilan	EI13 Kilkenny	JM01 Clarendon
IR09 Hamadan	EI15 Laois	JM02 Hanover
IR11 Hormozgan	EI14 Leitrim	JM17 Kingston
IR10 Ilam	EI16 Limerick	JM04 Manchester
IR29 Kerman	EI18 Longford	JM07 Portland
IR30 Khorasan	EI19 Louth	JM08 Saint Andrew
IR15 Khuzestan	EI20 Mayo	JM09 Saint Ann
IR05 Kohkiluyeh va Buyer	EI21 Meath	JM10 Saint Catherine
Ahmadi	EI22 Monaghan	JM11 Saint Elizabeth
IR16 Kordestan	EI23 Offaly	JM12 Saint James
IR23 Lorestan	EI24 Roscommon	JM13 Saint Mary
IR24 Markazi	EI25 Sligo	JM14 Saint Thomas
IR17 Mazandaran	EI26 Tipperary	JM15 Trelawny
IR25 Semnan	EI27 Waterford	JM16 Westmoreland
IR04 Sistan va Baluchestan	EI29 Westmeath	
IR26 Tehran	EI30 Wexford	JN JAN MAYEN

* JA JAPAN	DQ JARVIS ISLAND	KN12 P'yongyang-si
JA01 Aichi		KN13 Yanggang-do
JA02 Akita	JE JERSEY	
JA03 Aomori		* KS KOREA, REPUBLIC OF
JA04 Chiba	JQ JOHNSTON ATOLL	KS01 Cheju-do
JA05 Ehime		KS03 Cholla-bukto
JA06 Fukui	JO JORDAN	KS16 Cholla-namdo
JA07 Fukuoka	JO02 Al Balqa'	KS05 Ch'ungch'ong-bukto
JA08 Fukushima	JO09 Al Karak	KS17 Ch'ungch'ong-namdo
JA09 Gifu	JO10 Al Maфраq	KS12 Inch'on-jikhalsi
JA10 Gumma	JO11 `Amman	KS06 Kangwon-do
JA11 Hiroshima	JO12 At Tafilah	KS18 Kwangju-jikhalsi
JA12 Hokkaido	JO13 Az Zarqa	KS13 Kyonggi-do
JA13 Hyogo	JO14 Irbid	KS14 Kyongsang-bukto
JA14 Ibaraki	JO07 Ma`an	KS08 Kyongsang-namdo
JA15 Ishikawa		KS10 Pusan-jikhalsi
JA16 Iwate	JU JUAN DE NOVA ISLAND	KS11 Soul-t'ukpyolsi
JA17 Kagawa		KS15 Taegu-jikhalsi
JA18 Kagoshima	KZ KAZAKHSTAN	KS19 Taejon-jikhalsi
JA19 Kanagawa		
JA20 Kochi	KE KENYA	KU KUWAIT
JA21 Kumamoto	KE01 Central	KU01 Al Ahmadi
JA22 Kyoto	KE02 Coast	KU02 Al Kuwayt
JA23 Mie	KE03 Eastern	KU03 Hawalli
JA24 Miyagi	KE05 Nairobi Area	
JA25 Miyazaki	KE06 North-Eastern	KG KYRGYZSTAN
JA26 Nagano	KE07 Nyanza	
JA27 Nagasaki	KE08 Rift Valley	LA LAOS
JA28 Nara	KE09 Western	LA01 Attapu
JA29 Niigata		LA02 Champasak
JA30 Oita	KQ KINGMAN REEF	LA03 Houaphan
JA31 Okayama		LA04 Khammouan
JA47 Okinawa	KR KIRIBATI	LA05 Louang Namtha
JA32 Osaka	KR01 Gilbert Islands	LA06 Louangphrabang
JA33 Saga	KR02 Line Islands	LA07 Oudomxai
JA34 Saitama	KR03 Phoenix Islands	LA08 Phongsali
JA35 Shiga		LA09 Saravan
JA36 Shimane	KN KOREA, DEMOCRATIC	LA10 Savannakhet
JA37 Shizuoka	PEOPLE'S REPUBLIC OF	LA11 Vientiane
JA38 Tochigi	KN01 Chagang-do	LA13 Xaignabouri
JA39 Tokushima	KN16 Hamgyong-bukto	LA14 Xiangkhoang
JA40 Tokyo	KN03 Hamgyong-namdo	
JA41 Tottori	KN07 Hwanghae-bukto	LG LATVIA
JA42 Toyama	KN06 Hwanghae-namdo	
JA43 Wakayama	KN08 Kaesong-si	LE LEBANON
JA44 Yamagata	KN09 Kangwon-do	Al Biqa`
JA45 Yamaguchi	KN14 Namp'o-si	Al Janub
JA46 Yamanashi	KN11 P'yongan-bukto	Ash Shamal
	KN15 P'yongan-namdo	Bayrut

Jabal Lubnan	LY42 Tubruq	MI12 Mangochi
	LY62 Yafran	MI13 Mchinji
LT LESOTHO	LY45 Zlitan	MI14 Mulanje
LT10 Berea		MI25 Mwanza
LT11 Butha-Buthe	LS LIECHTENSTEIN	MI15 Mzimba
LT12 Leribe	LS01 Balzers	MI17 Nkhata Bay
LT13 Mafeteng	LS02 Eschen	MI18 Nkhotakota
LT14 Maseru	LS03 Gamprin	MI19 Nsanje
LT15 Mohales Hoek	LS04 Mauren	MI16 Ntcheu
LT16 Mokhotlong	LS05 Planken	MI20 Ntchisi
LT17 Qachas Nek	LS06 Ruggell	MI21 Rumphu
LT18 Quthing	LS07 Schaan	MI22 Salima
LT19 Thaba-Tseka	LS08 Schellenberg	MI05 Thyolo
	LS09 Triesen	MI23 Zomba
LI LIBERIA	LS10 Triesenberg	
LI01 Bong	LS11 Vaduz	* MY MALAYSIA
LI03 Grand Bassa		MY01 Johor
LI04 Grand Cape Mount	LH LITHUANIA	MY02 Kedah
LI02 Grand Jide		MY03 Kelantan
LI05 Lofa	LU LUXEMBOURG	MY15 Labuan
LI06 Maryland	LU01 Diekirch	MY04 Melaka
LI07 Monrovia	LU02 Grevenmacher	MY05 Negeri Sembilan
LI08 Montserrado	LU03 Luxembourg	MY06 Pahang
LI09 Nimba		MY07 Perak
LI10 Sino	MC MACAU	MY08 Perlis
	MC01 Ilhas	MY09 Pulau Pinang
LY LIBYA	MC02 Macau	MY16 Sabah
LY47 Ajdabiya		MY11 Sarawak
LY03 Al`Aziziyah	MK MACEDONIA	MY12 Selangor
LY48 Al Fatih		MY13 Terengganu
LY49 Al Jabal al Akhdar	MA MADAGASCAR	MY14 Wilayah Persekutuan
LY05 Al Jufrah	MA05 Antananarivo	
LY50 Al Khums	MA01 Antsiranana	MV MALDIVES
LY08 Al Kufrah	MA02 Fianarantsoa	MV02 Aliff
LY51 An Nuqat al Khams	MA03 Mahajanga	MV20 Baa
LY13 Ash Shati'	MA04 Toamasina	MV17 Daalu
LY52 Awbari	MA06 Toliara	MV14 Faafu
LY53 Az Zawiyah		MV27 Gaafu Aliff
LY54 Banghazi	MI MALAWI	MV28 Gaafu Daalu
LY55 Darnah	MI24 Blantyre	MV07 Haa Aliff
LY56 Ghadamis	MI02 Chikwawa	MV23 Haa Daalu
LY57 Gharyan	MI03 Chiradzulu	MV26 Kaafu
LY58 Misratah	MI04 Chitipa	MV05 Laamu
LY30 Murzuq	MI06 Dedza	MV03 Laviyani
LY34 Sabha	MI07 Dowa	MV12 Meemu
LY59 Sawfajjin	MI08 Karonga	MV29 Naviyani
LY60 Surt	MI09 Kasungu	MV25 Noonu
LY61 Tarabulus	MI11 Lilongwe	MV13 Ra
LY41 Tarhunah	MI10 Machinga	

MV01 Seenu	MP20 Savanne	MG01 Arhangay
MV24 Shaviyani		MG02 Bayanhongor
MV08 Thaa	MF MAYOTTE	MG03 Bayan-Olgii
MV04 Waavu		MG21 Bulgan
	* MX MEXICO	MG05 Darhan
ML MALI	MX01 Aguascalientes	MG06 Dornod
ML01 Bamako	MX02 Baja California	MG07 Dornogovi
ML02 Gao	MX03 Baja California Sur	MG08 Dundgovi
ML03 Kayes	MX04 Campeche	MG09 Dzavhan
ML07 Koulikoro	MX05 Chiapas	MG22 Erdenet
ML04 Mopti	MX06 Chihuahua	MG10 Govi-Altay
ML05 Segou	MX07 Coahuila de Zaragoza	MG11 Hentiy
ML06 Sikasso	MX08 Colima	MG12 Hovd
ML08 Tombouctou	MX09 Distrito Federal	MG13 Hovsgol
	MX10 Durango	MG14 Omnogovi
MT MALTA	MX11 Guanajuato	MG15 Ovorhangay
	MX12 Guerrero	MG16 Selenge
IM MAN, ISLE OF	MX13 Hidalgo	MG17 Suhbaatar
	MX14 Jalisco	MG18 Tov
RM MARSHALL ISLANDS	MX15 Mexico	MG20 Ulaanbaatar
	MX16 Michoacan de	MG19 Uvs
* MB MARTINIQUE	Ocampo	
	MX17 Morelos	MW MONTENEGRO
MR MAURITANIA	MX18 Nayarit	
MR07 Adrar	MX19 Nuevo Leon	MH MONTSERRAT
MR03 Assaba	MX20 Oaxaca	MH01 Saint Anthony
MR05 Brakna	MX21 Puebla	MH02 Saint Georges
MR08 Dakhlet Nouadhibou	MX22 Queretaro de Arteaga	MH03 Saint Peter
MR04 Gorgol	MX23 Quintana Roo	
MR10 Guidimaka	MX24 San Luis Potosi	MO MOROCCO
MR01 Hodh Ech Chargui	MX25 Sinaloa	MO01 Agadir
MR02 Hodh El Gharbi	MX26 Sonora	MO02 Al Hoceima
MR12 Inchiri	MX27 Tabasco	MO03 Azilal
MR09 Tagant	MX28 Tamaulipas	MO05 Beni Mellal
MR11 Tiris Zemmour	MX29 Tlaxcala	MO04 Ben Slimane
MR06 Trarza	MX30 Veracruz-Llave	MO06 Boulemane
	MX31 Yucatan	MO07 Casablanca
MP MAURITIUS	MX32 Zacatecas	MO08 Chaouen
MP21 Agalega Islands		MO09 El Jadida
MP12 Black River	MQ MIDWAY ISLANDS	MO10 El Kelaa des Srarhna
MP22 Cargados Carajos		MO11 Er Rachidia
MP13 Flacq	MD MOLDOVA	MO12 Essaouira
MP14 Grand Port		MO13 Fes
MP15 Moka	MN MONACO	MO14 Figuig
MP16 Pamplemousses	MN01 La Condamine	MO33 Guelmim
MP17 Plaines Wilhems	MN02 Monaco	MO34 Ifrane
MP18 Port Louis	MN03 Monte-Carlo	MO15 Kenitra
MP19 Riviere du Rempart		MO16 Khemisset
MP23 Rodrigues	MG MONGOLIA	MO17 Khenifra

MO18 Khouribga	WA26 Mariental	NL02 Friesland
MO35 Laayoune	WA27 Namaland	NL03 Gelderland
MO41 Larache	WA11 Okahandja	NL04 Groningen
MO19 Marrakech	WA12 Omaruru	NL14 Lelystad
MO20 Meknes	WA13 Otjiwarongo	NL05 Limburg
MO21 Nador	WA14 Outjo	NL06 Noord-Brabant
MO22 Ouarzazate	WA15 Owambo	NL07 Noord-Holland
MO23 Oujda	WA16 Rehoboth	NL08 Overijssel
MO24 Rabat-Sale	WA17 Swakopmund	NL09 Utrecht
MO25 Safi	WA18 Tsumeb	NL10 Zeeland
MO26 Settat	WA21 Windhoek	NL13 Zuidelijke
MO38 Sidi Kacem		IJsselmeerpolders
MO27 Tanger	NR00 NAURU	NL11 Zuid-Holland
MO36 Tan-Tan	NR01 Aiwo	
MO37 Taounate	NR02 Anabar	NT NETHERLANDS
MO39 Taroudannt	NR03 Anetan	ANTILLES
MO29 Tata	NR04 Anibare	
MO30 Taza	NR05 Baiti	NC NEW CALEDONIA
MO40 Tetouan	NR06 Boe	
MO32 Tiznit	NR07 Buada	* NZ NEW ZEALAND
	NR08 Denigomodu	NZ01 Akaroa
MZ MOZAMBIQUE	NR09 Ewa	NZ03 Amuri
MZ01 Cabo Delgado	NR10 Ijuw	NZ04 Ashburton
MZ02 Gaza	NR11 Meneng	NZ07 Bay of Islands
MZ03 Inhambane	NR12 Nibok	NZ08 Bruce
MZ10 Manica	NR13 Uaboe	NZ09 Buller
MZ04 Maputo	NR14 Yaren	NZ10 Chatham Islands
MZ06 Nampula		NZ11 Cheviot
MZ07 Niassa	BQ NAVASSA ISLAND	NZ12 Clifton
MZ05 Sofala		NZ13 Clutha
MZ08 Tete	NP NEPAL	NZ14 Cook
MZ09 Zambezia	NP01 Bagmati	NZ16 Dannevirke
	NP02 Bheri	NZ17 Egmont
WA NAMIBIA	NP03 Dhawalagiri	NZ18 Eketahuna
WA01 Bethanien	NP04 Gandaki	NZ19 Ellesmere
WA03 Boesmanland	NP05 Janakpur	NZ20 Eltham
WA02 Caprivi Oos	NP06 Karnali	NZ21 Eyre
WA22 Damaraland	NP07 Kosi	NZ22 Featherston
WA04 Gobabis	NP08 Lumbini	NZ24 Franklin
WA05 Grootfontein	NP09 Mahakali	NZ26 Golden Bay
WA23 Hereroland Oos	NP10 Mechi	NZ27 Great Barrier Island
WA24 Hereroland Wes	NP11 Narayani	NZ28 Grey
WA06 Kaokoland	NP12 Rapti	NZ29 Hauraki Plains
WA20 Karasburg	NP13 Sagarmatha	NZ30 Hawera
WA07 Karibib	NP14 Seti	NZ31 Hawke's Bay
WA25 Kavango		NZ32 Heathcote
WA08 Keetmanshoop	* NL NETHERLANDS	NZD9 Hikurangi
WA09 Luderitz	NL01 Drenthe	NZ33 Hobson
WA10 Maltahohe	NL12 Dronen	NZ34 Hokianga

NZ35 Horowhenua	NZ83 Waiapu	NG03 Dosso
NZD4 Hurunui	NZD8 Waiheke	NG04 Maradi
NZ36 Hutt	NZ84 Waihemo	NG05 Niamey
NZ37 Inangahua	NZ85 Waikato	NG06 Tahoua
NZ38 Inglewood	NZ86 Waikohu	NG07 Zinder
NZ39 Kaikoura	NZ88 Waimairi	
NZ40 Kairanga	NZ89 Waimarino	NI NIGERIA
NZ41 Kiwitea	NZ90 Waimate	NI34 Abia
NZ43 Lake	NZ91 Waimate West	NI11 Abuja Capital Territory
NZ45 Mackenzie	NZ92 Waimea	NI35 Adamawa
NZ46 Malvern	NZ93 Waipa	NI21 Akwa Ibom
NZE1 Manaia	NZ95 Waipawa	NI25 Anambra
NZ47 Manawatu	NZ96 Waipukurau	NI06 Bauchi
NZ48 Mangonui	NZ97 Wairarapa South	NI26 Benue
NZ49 Maniototo	NZ98 Wairewa	NI27 Borno
NZ50 Marlborough	NZ99 Wairoa	NI22 Cross River
NZ51 Masterton	NZA4 Waitaki	NI36 Delta
NZ52 Matamata	NZA6 Waitomo	NI37 Edo
NZ53 Mount Herbert	NZA8 Waitotara	NI38 Enugu
NZ54 Ohinemuri	NZE6 Wallace	NI28 Imo
NZ55 Opotiki	NZB2 Wanganui	NI39 Jigawa
NZ56 Oroua	NZE5 Waverley	NI23 Kaduna
NZ57 Otamatea	NZB3 Westland	NI29 Kano
NZ58 Otorohanga	NZB4 Whakatane	NI24 Katsina
NZ59 Oxford	NZA1 Whangarei	NI40 Kebbi
NZ60 Pahiatua	NZA2 Whangaroa	NI41 Kogi
NZ61 Paparua	NZA3 Woodville	NI30 Kwara
NZ63 Patea		NI05 Lagos
NZ65 Piako	NU NICARAGUA	NI31 Niger
NZ66 Pohangina	NU01 Boaco	NI16 Ogun
NZ67 Raglan	NU02 Carazo	NI17 Ondo
NZ68 Rangiora	NU03 Chinandega	NI42 Osun
NZ69 Rangitikei	NU04 Chontales	NI32 Oyo
NZ70 Rodney	NU05 Esteli	NI19 Plateau
NZ71 Rotorua	NU06 Granada	NI10 Rivers
NZE2 Runanga	NU07 Jinotega	NI33 Sokoto
NZE3 Saint Kilda	NU08 Leon	NI43 Taraba
NZD5 Silverpeaks	NU09 Madriz	NI44 Yobe
NZ72 Southland	NU10 Managua	
NZ73 Stewart Island	NU11 Masaya	NE NIUE
NZ74 Stratford	NU12 Matagalpa	
NZD6 Strathallan	NU13 Nueva Segovia	NF NORFOLK ISLAND
NZ76 Taranaki	NU14 Rio San Juan	
NZ77 Taumarunui	NU15 Rivas	CQ NORTHERN MARIANA ISLANDS
NZ78 Taupo	NU16 Zelaya	
NZ79 Tauranga		
NZE4 Thames-Coromandel	NG NIGER	*NO NORWAY
NZ81 Tuapeka	NG01 Agadez	NO01 Akershus
NZ82 Vincent	NG02 Diffa	NO02 Aust-Agder

NO04 Buskerud
 NO05 Finnmark
 NO06 Hedmark
 NO07 Hordaland
 NO08 More og Romsdal
 NO09 Nordland
 NO10 Nord-Trondelag
 NO11 Oppland
 NO12 Oslo
 NO13 Ostfold
 NO14 Rogaland
 NO15 Sogn og Fjordane
 NO16 Sor-Trondelag
 NO17 Telemark
 NO18 Troms
 NO19 Vest-Agder
 NO20 Vestfold

MU OMAN

PK PAKISTAN
 PK06 Azad Kashmir
 PK02 Balochistan
 PK01 Federally Administered
 Tribal Areas
 PK08 Islamabad
 PK07 Northern Areas
 PK03 North-West Frontier
 PK04 Punjab
 PK05 Sindh

LQ PALMYRA ATOLL

* PM PANAMA
 PM01 Bocas del Toro
 PM02 Chiriqui
 PM03 Cocle
 PM04 Colon
 PM05 Darien
 PM06 Herrera
 PM07 Los Santos
 PM08 Panama
 PM09 San Blas
 PM10 Veraguas

PP PAPUA NEW GUINEA
 PP01 Central
 PP08 Chimbu
 PP09 Eastern Highlands

PP10 East New Britain
 PP11 East Sepik
 PP19 Enga
 PP02 Gulf
 PP12 Madang
 PP13 Manus
 PP03 Milne Bay
 PP14 Morobe
 PP20 National Capital
 PP15 New Ireland
 PP04 Northern
 PP07 North Solomons
 PP18 Sandaun
 PP05 Southern Highlands
 PP06 Western
 PP16 Western Highlands
 PP17 West New Britain

PF PARACEL ISLANDS

PA PARAGUAY
 PA18 Alto Paraguay
 PA01 Alto Parana
 PA02 Amambay
 PA03 Boqueron
 PA04 Caaguazu
 PA05 Caazapa
 PA19 Canindeyu
 PA06 Central
 PA20 Chaco
 PA07 Concepcion
 PA08 Cordillera
 PA10 Guaira
 PA11 Itapua
 PA12 Misiones
 PA13 Neembucu
 PA21 Nueva Asuncion
 PA15 Paraguari
 PA16 Presidente Hayes
 PA17 San Pedro

PE PERU
 PE01 Amazonas
 PE02 Ancash
 PE03 Apurimac
 PE04 Arequipa
 PE05 Ayacucho
 PE06 Cajamarca
 PE07 Callao

PE08 Cusco
 PE09 Huancavelica
 PE10 Huanuco
 PE11 Ica
 PE12 Junin
 PE13 La Libertad
 PE14 Lambayeque
 PE15 Lima
 PE16 Loreto
 PE17 Madre de Dios
 PE18 Moquegua
 PE19 Pasco
 PE20 Piura
 PE21 Puno
 PE22 San Martin
 PE23 Tacna
 PE24 Tumbes
 PE25 Ucayali

RP PHILIPPINES

RP01 Abra
 RP02 Agusan del Norte
 RP03 Agusan del Sur
 RP04 Aklan
 RP05 Albay
 RPA1 Angeles
 RP06 Antique
 RPG8 Aurora
 RPA2 Bacolod
 RPA3 Bago
 RPA4 Baguio
 RPA5 Bais
 RP22 Basilan
 RPA6 Basilan City
 RP07 Bataan
 RP08 Batanes
 RP09 Batangas
 RPA7 Batangas City
 RP10 Benguet
 RP11 Bohol
 RP12 Bukidnon
 RP13 Bulacan
 RPA8 Butuan
 RPA9 Cabanatuan
 RPB1 Cadiz
 RP14 Cagayan
 RPB2 Cagayan de Oro
 RPB3 Calbayog
 RPB4 Caloocan

RP15	Camarines Norte	RP40	Mindoro Occidental	RPG4	Tangub
RP16	Camarines Sur	RP41	Mindoro Oriental	RP63	Tarlac
RP17	Camiguin	RP42	Misamis Occidental	RP72	Tawitawi
RPB5	Canlaon	RP43	Misamis Oriental	RPG5	Toledo
RP18	Capiz	RP44	Mountain	RPG6	Trece Martires
RP19	Catanduanes	RPE2	Naga	RP64	Zambales
RP20	Cavite	RPH3	Negros Occidental	RPG7	Zamboanga
RPB6	Cavite City	RP46	Negros Oriental	RP65	Zamboanga del Norte
RP21	Cebu	RP57	North Cotabato	RP66	Zamboanga del Sur
RPB7	Cebu City	RP67	Northern Samar		
RPB8	Cotabato	RP47	Nueva Ecija	PC	PITCAIRN ISLANDS
RPB9	Dagupan	RP48	Nueva Vizcaya		
RPC1	Danao	RPE3	Olongapo	* PL	POLAND
RPC2	Dapitan	RPE4	Ormoc	PL23	Biala Podlaska
RP24	Davao	RPE5	Oroquieta	PL24	Bialystok
RPC3	Davao City	RPE6	Ozamis	PL25	Bielsko
RP25	Davao del Sur	RPE7	Pagadian	PL26	Bydgoszcz
RP26	Davao Oriental	RP49	Palawan	PL27	Chelm
RPC4	Dipolog	RPE8	Palayan	PL28	Ciechanow
RPC5	Dumaguete	RP50	Pampanga	PL29	Czestochowa
RP23	Eastern Samar	RP51	Pangasinan	PL30	Elblag
RPC6	General Santos	RPE9	Pasay	PL31	Gdansk
RPC7	Gingoog	RPF1	Puerto Princesa	PL32	gorzow
RP27	Ifugao	RPH2	Quezon	PL33	Jelenia Gora
RPC8	Iligan	RPF2	Quezon City	PL34	Kalisz
RP28	Ilocos Norte	RP68	Quirino	PL35	Katowice
RP29	Ilocos Sur	RP53	Rizal	PL36	Kielce
RP30	Iloilo	RP54	Romblon	PL37	Konin
RPC9	Iloilo City	RPF3	Roxas	PL38	Koszalin
RPD1	Iriga	RP55	Samar	PL39	Krakow
RP31	Isabela	RPF4	San Carlos, Negros Occidental	PL40	Krosno
RP32	Kalinga-Apayao	RPF5	San Carlos, Pangasinan	PL41	Legnica
RPD2	La Carlota	RPF6	San Jose	PL42	Leszno
RP33	Laguna	RPF7	San Pablo	PL43	Lodz
RP34	Lanao del Norte	RPF8	Silay	PL44	Lomza
RP35	Lanao del Sur	RP69	Siquijor	PL45	Lublin
RPD3	Laoag	RP58	Sorsogon	PL46	Nowy Sacz
RPD4	Lapu-Lapu	RP70	South Cotabato	PL47	Olsztyn
RP36	La Union	RP59	Southern Leyte	PL48	Opole
RPD5	Legaspi	RP71	Sultan Kudarat	PL49	Ostroleka
RP37	Leyte	RP60	Sulu	PL50	Pila
RPD6	Lipa	RPF9	Surigao	PL51	Piotrkow
RPD7	Lucena	RP61	Surigao del Norte	PL52	Plock
RP56	Maguindanao	RP62	Surigao del Sur	PL53	Poznan
RPD8	Mandaue	RPG1	Tacloban	PL54	Przemysl
RPD9	Manila	RPG2	Tagaytay	PL55	Radom
RPE1	Marawi	RPG3	Tagbilaran	PL56	Rzeszow
RP38	Marinduque			PL57	Siedlce
RP39	Masbate			PL58	Sieradz

PL59 Skierniewice
 PL60 Slupsk
 PL61 Suwalki
 PL62 Szczecin
 PL63 Tarnobrzeg
 PL64 Tarnow
 PL65 Torun
 PL66 Walbrzych
 PL67 Warszawa
 PL68 Wloclawek
 PL69 Wroclaw
 PL70 Zamosc
 PL71 Zielona Gora

PO PORTUGAL

PO02 Aveiro
 PO23 Azores
 PO03 Beja
 PO04 Braga
 PO05 Braganca
 PO06 Castelo Branco
 PO07 Coimbra
 PO08 Evora
 PO09 Faro
 PO11 Guarda
 PO13 Leiria
 PO14 Lisboa
 PO10 Madeira
 PO16 Portalegre
 PO17 Porto
 PO18 Santarem
 PO19 Setubal
 PO20 Viana do Castelo
 PO21 Vila Real
 PO22 Viseu

RQ PUERTO RICO

QA QATAR

RE REUNION

RO ROMANIA

RO01 Alba
 RO02 Arad
 RO03 Arges
 RO04 Bacau
 RO05 Bihor
 RO06 Bistrita-Nasaud

RO07 Botosani
 RO08 Braila
 RO09 Brasov
 RO10 Bucuresti
 RO11 Buzau
 RO41 Calarasi
 RO12 Caras-Severin
 RO13 Cluj
 RO14 Constanta
 RO15 Covasna
 RO16 Dimbovita
 RO17 Dolj
 RO18 Galati
 RO19 Gorj
 RO42 Giurgiu
 RO20 Harghita
 RO21 Hunedoara
 RO22 Ialomita
 RO23 Iasi
 RO25 Maramures
 RO26 Mehedinti
 RO27 Mures
 RO28 Neamt
 RO29 Olt
 RO30 Prahova
 RO31 Salaj
 RO32 Satu Mare
 RO33 Sibiu
 RO34 Suceava
 RO35 Teleorman
 RO36 Timis
 RO37 Tulcea
 RO38 Vaslui
 RO39 Vilcea
 RO40 Vrancea

* RS RUSSIA

RW RWANDA

RW01 Butare
 RW02 Byumba
 RW03 Cyangugu
 RW04 Gikongoro
 RW05 Gisenyi
 RW06 Gitarama
 RW07 Kibungo
 RW08 Kibuye
 RW09 Kigali
 RW10 Ruhengeri

SC ST. KITTS AND NEVIS
 SC01 Christ Church Nichola
 Town
 SC02 Saint Anne Sandy
 Point
 SC03 Saint George
 Basseterre
 SC04 Saint George
 Gingerland
 SC05 Saint James Windward
 SC06 Saint John Capisterre
 SC07 Saint John Figtree
 SC08 Saint Mary Cayon
 SC09 Saint Paul Capisterre
 SC10 Saint Paul
 Charlestown
 SC11 Saint Peter Basseterre
 SC12 Saint Thomas Lowland
 SC13 Saint Thomas Middle
 Island
 SC15 Trinity Palmetto Point

SH ST. HELENA

SH01 Ascension
 SH02 Saint Helena
 SH03 Tristan da Cunha

ST ST. LUCIA

ST01 Anse-la-Ray
 ST03 Castries
 ST04 Choiseul
 ST02 Dauphin
 ST05 Dennery
 ST06 Gros-Islet
 ST07 Laborie
 ST08 Micoud
 ST11 Praslin
 ST09 Soufriere
 ST10 Vieux-Fort

SB ST. PIERRE AND
 MIQUELON

VC ST. VINCENT AND THE
 GRENADINES

VC01 Charlotte
 VC06 Grenadines
 VC02 Saint Andrew
 VC03 Saint David

VC04 Saint George
VC05 Saint Patrick

SM SAN MARINO
SM01 Acquaviva
SM06 Borgo Maggiore
SM02 Chiesanuova
SM03 Domagnano
SM04 Faetano
SM05 Fiorentino
SM08 Monte Giardino
SM07 San Marino
SM09 Serravalle

TP SAO TOME AND
PRINCIPE

TP01 Principe
TP02 Sao Tome

SA SAUDI ARABIA
SA02 Al Bahah
SA15 Al Hudud ash
Shamaliyah
SA03 Al Jawf
SA05 Al Madinah
SA08 Al Qasim
SA09 Al Qurayyat
SA10 Ar Riyad
SA06 Ash Sharqiyah
SA11 `Asir
SA13 Ha'il
SA17 Jizan
SA14 Makkah
SA16 Najran
SA19 Tabuk

SG SENEGAL
SG01 Dakar
SG03 Diourbel
SG09 Fatick
SG10 Kaolack
SG11 Kolda
SG08 Louga
SG04 Saint-Louis
SG05 Tambacounda
SG07 Thies
SG12 Ziguinchor

SR SERBIA

SE SEYCHELLES

SE01 Anse aux Pins
SE02 Anse Boileau
SE03 Anse Etoile
SE04 Anse Louis
SE05 Anse Royale
SE06 Baie Lazare
SE07 Baie Sainte Anne
SE08 Beau Vallon
SE09 Bel Air
SE10 Bel Ombre
SE11 Cascade
SE12 Glacis
SE13 Grand' Anse (Mahe)
SE14 Grand' Anse (Praslin)
SE15 La Digue
SE16 La Riviere Anglaise
SE17 Mont Buxton
SE18 Mont Fleuri
SE19 Plaisance
SE20 Pointe La Rue
SE21 Port Glaud
SE22 Saint Louis
SE23 Takamaka

SL SIERRA LEONE

SL01 Eastern
SL02 Northern
SL03 Southern
SL04 Western Area

SN SINGAPORE

* LO SLOVAKIA

* SI SLOVENIA

BP SOLOMON ISLANDS

BP05 Central
BP06 Guadalcanal
BP07 Isabel
BP08 Makira
BP03 Malaita
BP09 Temotu
BP04 Western

SO SOMALIA

SO01 Bakool

SO02 Banaadir
SO03 Bari
SO04 Bay
SO05 Galguduud
SO06 Gedo
SO07 Hiiraan
SO08 Jubbada Dhexe
SO09 Jubbada Hoose
SO10 Mudug
SO11 Nugaal
SO12 Sanaag
SO13 Shabeellaha Dhexe
SO14 Shabeellaha Hoose
SO15 Togdheer
SO16 Woqooyi Galbeed

SF SOUTH AFRICA

SF01 Cape Province
SF02 Natal
SF03 Orange Free State
SF04 Transvaal

SX SOUTH GEORGIA AND
THE SOUTH SANDWICH
ISLANDS

* SP SPAIN

SP51 Andalucia
SP52 Aragon
SP34 Asturias
SP53 Canarias
SP39 Cantabria
SP54 Castilla-La Mancha
SP55 Castilla y Leon
SP56 Cataluna
SP57 Extremadura
SP58 Galicia
SP07 Islas Baleares
SP27 La Rioja
SP29 Madrid
SP31 Murcia
SP32 Navarra
SP59 Pais Vasco
SP60 Valenciana

PG SPRATLY ISLANDS

CE SRI LANKA

CE01 Amparai

CE02 Anuradhapura	WZ SWAZILAND	SZ14 Obwalden
CE03 Badulla	WZ01 Hhohho	SZ15 Sankt Gallen
CE04 Batticaloa	WZ02 Lubombo	SZ16 Schaffhausen
CE23 Colombo	WZ03 Manzini	SZ17 Schwyz
CE06 Galle	WZ05 Praslin	SZ18 Solothurn
CE24 Gampaha	WZ04 Shiselweni	SZ19 Thurgau
CE07 Hambantota		SZ20 Ticino
CE25 Jaffna	* SW SWEDEN	SZ21 Uri
CE09 Kalutara	SW01 Alvsborgs Lan	SZ22 Valais
CE10 Kandy	SW02 Blekinge Lan	SZ23 Vaud
CE11 Kegalla	SW03 Gavleborgs Lan	SZ24 Zug
CE12 Kurunegala	SW04 Goteborgs och	SZ25 Zurich
CE26 Mannar	Bohus Lan	
CE14 Matale	SW05 Gotlands Lan	SY SYRIA
CE15 Matara	SW06 Hallands Lan	SY01 Al Hasakah
CE16 Moneragala	SW07 Jamtlands Lan	SY02 Al Ladhiqiyah
CE27 Mullaittivu	SW08 Jonkopings Lan	SY03 Al Qunaytirah
CE17 Nuwara Eliya	SW09 Kalmar Lan	SY04 Ar Raqqa
CE18 Polonnaruwa	SW10 Kopparbergs Lan	SY05 As Suwayda'
CE19 Puttalam	SW11 Kristianstads Lan	SY06 Dar'a
CE20 Ratnapura	SW12 Kronobergs Lan	SY07 Dayr az Zawr
CE21 Trincomalee	SW13 Malmohus Lan	SY13 Dimashq
CE28 Vavuniya	SW14 Norrbottens Lan	SY09 Halab
	SW15 Orebro Lan	SY10 Hamah
SU SUDAN	SW16 Ostergotlands Lan	SY11 Hims
SU26 A'ali an Nil	SW17 Skaraborgs Lan	SY12 Idlib
SU28 Al Istiwa'iyah	SW18 Sodermanlands Lan	SY08 Rif Dimashq
SU29 Al Khartum	SW26 Stockholms Lan	SY14 Tartus
SU27 Al Wusta	SW21 Uppsala Lan	
SU30 Ash Shamaliyah	SW22 Varmlands Lan	TI TAJIKISTAN
SU31 Ash Sharqiyah	SW23 Vasterbottens Lan	
SU32 Bahr al Ghazal	SW24 Vasternorrlands Lan	TZ TANZANIA
SU33 Darfur	SW25 Vastmanlands Lan	TZ01 Arusha
SU34 Kurdufan		TZ23 Dar es Salaam
	* SZ SWITZERLAND	TZ03 Dodoma
NS SURINAME	SZ01 Aargau	TZ04 Iringa
NS10 Brokopondo	SZ02 Ausser-Rhoden	TZ05 Kigoma
NS11 Commewijne	SZ03 Basel-Landschaft	TZ06 Kilimanjaro
NS12 Coronie	SZ04 Basel-Stadt	TZ07 Lindi
NS13 Marowijne	SZ05 Bern	TZ08 Mara
NS14 Nickerie	SZ06 Fribourg	TZ09 Mbeya
NS15 Para	SZ07 Geneve	TZ10 Morogoro
NS16 Paramaribo	SZ08 Glarus	TZ11 Mtwara
NS17 Saramacca	SZ09 Graubunden	TZ12 Mwanza
NS18 Sipaliwini	SZ10 Inner-Rhoden	TZ13 Pemba North
NS19 Wanica	SZ26 Jura	TZ20 Pemba South
	SZ11 Luzern	TZ02 Pwani
SV SVALBARD	SZ12 Neuchatel	TZ24 Rukwa
	SZ13 Nidwalden	TZ14 Ruvuma

TZ15 Shinyanga	TH13 Phichit	TO12 Niamtougou
TZ16 Singida	TH12 Phitsanulok	TO13 Notse
TZ17 Tabora	TH36 Phra Nakhon Si	TO16 Sotouboua
TZ18 Tanga	Ayutthaya	TO17 Tabligbo
TZ21 Zanzibar Central/South	TH07 Phrae	TO19 Tchamba
TZ22 Zanzibar North	TH62 Phuket	TO20 Tchaoudjo
TZ25 Zanzibar Urban/West	TH45 Prachin Buri	TO18 Tsevie
TZ19 Ziwa Magharibi	TH57 Prachuap Khiri Khan	TO21 Vogan
	TH59 Ranong	
TH THAILAND	TH52 Ratchaburi	TL TOKELAU
TH35 Ang Thong	TH47 Rayong	
TH28 Buriram	TH25 Roi Et	TN TONGA
TH44 Chachoengsao	TH20 Sakon Nakhon	TN01 Ha'apai
TH32 Chai Nat	TH42 Samut Prakan	TN02 Tongatapu
TH26 Chaiphum	TH55 Samut Sakhon	TN03 Vava'u
TH48 Chanthaburi	TH54 Samut Songkhram	
TH02 Chiang Mai	TH37 Saraburi	TD TRINIDAD AND
TH03 Chiang Rai	TH67 Satun	TOBAGO
TH46 Chon Buri	TH33 Sing Buri	TD01 Arima
TH58 Chumphon	TH30 Sisaket	TD02 Caroni
TH23 Kalasin	TH68 Songkhla	TD03 Mayaro
TH11 Kamphaeng Phet	TH09 Sukhothai	TD04 Nariva
TH50 Kanchanaburi	TH51 Suphan Buri	TD05 Port-of-Spain
TH22 Khon Kaen	TH60 Surat Thani	TD06 Saint Andrew
TH63 Krabi	TH29 Surin	TD07 Saint David
TH40 Krung Thep	TH08 Tak	TD08 Saint George
TH06 Lampang	TH65 Trang	TD09 Saint Patrick
TH05 Lamphun	TH49 Trat	TD10 San Fernando
TH18 Loei	TH71 Ubon Ratchathani	TD11 Tobago
TH34 Lop Buri	TH19 Udon Thani	TD12 Victoria
TH01 Mae Hong Son	TH15 Uthai Thani	TE TROMELIN ISLAND
TH24 Maha Sarakham	TH10 Uttaradit	
TH43 Nakhon Nayok	TH70 Yala	PS TRUST TERRITORY OF
TH53 Nakhon Pathom	TH72 Yasothon	THE PACIFIC ISLANDS
TH21 Nakhon Phanom		(PALAU)
TH27 Nakhon Ratchasima	TO TOGO	
TH16 Nakhon Sawan	TO01 Amlame	TS TUNISIA
TH64 Nakhon Si Thammarat	TO02 Aneho	TS14 Al Kaf
TH04 Nan	TO03 Atakpame	TS15 Al Mahdiyah
TH31 Narathiwat	TO15 Badou	TS16 Al Munastir
TH17 Nong Khai	TO04 Bafilo	TS02 Al Qasrayn
TH38 Nonthaburi	TO05 Bassar	TS03 Al Qayrawan
TH39 Pathum Thani	TO06 Dapaong	TS26 Aryanah
TH69 Pattani	TO07 Kante	TS17 Bajah
TH61 Phangnga	TO08 Klouto	TS18 Banzart
TH66 Phatthalung	TO14 Kpagouda	TS27 Bin'Arus
TH41 Phayao	TO09 Lama-Kara	TS06 Jundubah
TH14 Phetchabun	TO10 Lome	TS28 Madanin
TH56 Phetchaburi	TO11 Mango	TS19 Nabul

TS29 Qabis
TS10 Qafsah
TS31 Qibili
TS32 Safaqis
TS33 Sidi Bu Zayd
TS22 Silyanah
TS23 Susah
TS34 Tatawin
TS35 Tawzar
TS36 Tunis
TS37 Zaghwana

TU TURKEY

TU01 Adana
TU02 Adiyaman
TU03 Afyon
TU04 Agri
TU75 Aksaray
TU05 Amasya
TU68 Ankara
TU07 Antalya
TU08 Artvin
TU09 Aydin
TU10 Balikesir
TU76 Batman
TU77 Bayburt
TU11 Bilecik
TU12 Bingol
TU13 Bitlis
TU14 Bolu
TU15 Burdur
TU16 Bursa
TU17 Canakkale
TU18 Cankiri
TU19 Corum
TU20 Denizli
TU21 Diyarbakir
TU22 Edirne
TU23 Elazig
TU24 Erzincan
TU25 Erzurum
TU26 Eskisehir
TU27 Gaziantep
TU28 Giresun
TU69 Gumushane
TU70 Hakkari
TU31 Hatay
TU32 Icel
TU33 Isparta

TU34 Istanbul
TU35 Izmir
TU46 Kahraman Maras
TU78 Karaman
TU36 Kars
TU37 Kastamonu
TU38 Kayseri
TU79 Kirikkale
TU39 Kirklareli
TU40 Kirsehir
TU41 Kocaeli
TU71 Konya
TU43 Kutahya
TU44 Malatya
TU45 Manisa
TU72 Mardin
TU48 Mugla
TU49 Mus
TU50 Nevsehir
TU73 Nigde
TU52 Ordu
TU53 Rize
TU54 Sakarya
TU55 Samsun
TU74 Siirt
TU57 Sinop
TU80 Sirnak
TU58 Sivas
TU59 Tekirdag
TU60 Tokat
TU61 Trabzon
TU62 Tunceli
TU63 Urfa
TU64 Usak
TU65 Van
TU66 Yozgat
TU67 Zonguldak

TX TURKMENISTAN

TK TURKS AND CAICOS
ISLANDS

TV TUVALU

UG UGANDA
UG05 Busoga
UG18 Central
UG20 Eastern

UG08 Karamoja
UG21 Nile
UG22 North Buganda
UG23 Northern
UG12 South Buganda
UG24 Southern
UG25 Western

* UP UKRAINE

UP01 Cherkas'ka Oblast'
UP02 Chernihivs'ka Oblast'
UP03 Chernivets'ka Oblast'
UP04 Dnipropetrovs'ka
Oblast'
UP05 Donets'ka Oblast'
UP06 Ivano-Frankivs'ka
Oblast'
UP07 Kharkivs'ka Oblast'
UP08 Khersons'ka Oblast'
UP09 Khmel'nyts'ka Oblast'
UP10 Kirovohrads'ka Oblast'
UP11 Krym, Respublika
UP12 Kyiv, Misto
UP13 Kyiv's'ka Oblast'
UP14 Luhans'ka Oblast'
UP15 L'vivs'ka Oblast'
UP16 Mykolayivs'ka Oblast'
UP17 Odes'ka Oblast'
UP18 Poltavs'ka Oblast'
UP19 Rivnens'ka Oblast'
UP20 Sevastopol', Misto
UP21 Sums'ka Oblast'
UP22 Ternopil's'ka Oblast'
UP23 Vinnyts'ka Oblast'
UP24 Volyns'ka Oblast'
UP25 Zakarpats'ka Oblast'
UP26 Zaporiz'ka Oblast'
UP27 Zhytomyrs'ka Oblast'

TC UNITED ARAB
EMIRATES

TC01 Abu Zaby
TC02 `Ajman
TC04 Al Fujayrah
TC06 Ash Shariqah
TC03 Dubayy
TC05 Ra's al Khaymah
TC07 Umm al Qaywayn

* UK UNITED KINGDOM

UK01 Avon
 UK02 Bedford
 UK03 Berkshire
 UK04 Buckingham
 UK05 Cambridge
 UK06 Cheshire
 UK07 Cleveland
 UK08 Cornwall
 UK09 Cumbria
 UK10 Derby
 UK11 Devon
 UK12 Dorset
 UK13 Durham
 UK14 East Sussex
 UK15 Essex
 UK16 Gloucester
 UK17 Greater London
 UK18 Greater Manchester
 UK19 Hampshire
 UK20 Hereford and
 Worcester
 UK21 Hertford
 UK22 Humberside
 UK23 Isle of Wight
 UK24 Kent
 UK25 Lancashire
 UK26 Leicester
 UK27 Lincoln
 UK28 Merseyside
 UK29 Norfolk
 UK31 Northampton
 UK32 Northumberland
 UK30 North Yorkshire
 UK33 Nottingham
 UK34 Oxford
 UK35 Shropshire
 UK36 Somerset
 UK37 South Yorkshire
 UK38 Stafford
 UK39 Suffolk
 UK40 Surrey
 UK41 Tyne and Wear
 UK42 Warwick
 UK43 West Midlands
 UK44 West Sussex
 UK45 West Yorkshire
 UK46 Wiltshire
 UK52 Antrim

UK53 Ards
 UK54 Armagh
 UK55 Ballymena
 UK56 Ballymoney
 UK57 Banbridge
 UK58 Belfast
 UK59 Carrickfergus
 UK60 Castlereagh
 UK61 Coleraine
 UK62 Cookstown
 UK63 Craigavon
 UK64 Down
 UK65 Dungannon
 UK66 Fermanagh
 UK67 Larne
 UK68 Limavady
 UK69 Lisburn
 UK70 Londonderry
 UK71 Magherafelt
 UK72 Moyle
 UK73 Newry and Mourne
 UK74 Newtownabbey
 UK75 North Down
 UK76 Omagh
 UK77 Strabane
 UK78 Borders
 UK79 Central
 UK80 Dumfries and
 Galloway
 UK81 Fife
 UK82 Grampian
 UK83 Highland
 UK84 Lothian
 UK85 Orkney
 UK86 Shetland
 UK87 Strathclyde
 UK88 Tayside
 UK89 Western Isles
 UK90 Clwyd
 UK91 Dyfed
 UK92 Gwent
 UK93 Gwynedd
 UK94 Mid Glamorgan
 UK95 Powys
 UK96 South Glamorgan
 UK97 West Glamorgan

* US UNITED STATES
 * US01 Alabama

* US02 Alaska
 * US04 Arizona
 * US05 Arkansas
 * US06 California
 * US08 Colorado
 * US09 Connecticut
 * US10 Delaware
 * US11 District of Columbia
 * US12 Florida
 * US13 Georgia
 * US15 Hawaii
 * US16 Idaho
 * US17 Illinois
 * US18 Indiana
 * US19 Iowa
 * US20 Kansas
 * US21 Kentucky
 * US22 Louisiana
 * US23 Maine
 * US24 Maryland
 * US25 Massachusetts
 * US26 Michigan
 * US27 Minnesota
 * US28 Mississippi
 * US29 Missouri
 * US30 Montana
 * US31 Nebraska
 * US32 Nevada
 * US33 New Hampshire
 * US34 New Jersey
 * US35 New Mexico
 * US36 New York
 * US37 North Carolina
 * US38 North Dakota
 * US39 Ohio
 * US40 Oklahoma
 * US41 Oregon
 * US42 Pennsylvania
 * US44 Rhode Island
 * US45 South Carolina
 * US46 South Dakota
 * US47 Tennessee
 * US48 Texas
 * US49 Utah
 * US50 Vermont
 * US51 Virginia
 * US53 Washington
 * US54 West Virginia
 * US55 Wisconsin

* US56 Wyoming

UY URUGUAY

UY01 Artigas
UY02 Canelones
UY03 Cerro Largo
UY04 Colonia
UY05 Durazno
UY06 Flores
UY07 Florida
UY08 Lavalleja
UY09 Maldonado
UY10 Montevideo
UY11 Paysandu
UY12 Rio Negro
UY13 Rivera
UY14 Rocha
UY15 Salto
UY16 San Jose
UY17 Soriano
UY18 Tacuarembó
UY19 Treinta y Tres

UZ UZBEKISTAN

NH VANUATU

NH05 Ambrym
NH06 Aoba/Maewo
NH07 Banks/Torres
NH08 Efate
NH09 Epi
NH10 Malakula
NH11 Paama
NH12 Pentecote
NH13 Santo/Malo
NH14 Shepherd
NH15 Tafea

VT VATICAN CITY

VE VENEZUELA

VE01 Amazonas
VE02 Anzoategui
VE03 Apure
VE04 Aragua
VE05 Barinas
VE06 Bolívar
VE07 Carabobo
VE08 Cojedes
VE09 Delta Amacuro

VE24 Dependencias

Federales

VE10 Distrito Federal
VE11 Falcon
VE12 Guarico
VE13 Lara
VE14 Merida
VE15 Miranda
VE16 Monagas
VE17 Nueva Esparta
VE18 Portuguesa
VE19 Sucre
VE20 Tachira
VE21 Trujillo
VE22 Yaracuy
VE23 Zulia

VM VIETNAM

VM43 An Giang
VM53 Ba Ria-Vung Tau
VM02 Bac Thai
VM03 Ben Tre
VM54 Binh Dinh
VM55 Binh Thuan
VM56 Can Tho
VM05 Cao Bang
VM44 Dac Lac
VM45 Dong Nai
VM46 Dong Thap
VM57 Gia Lai
VM11 Ha Bac
VM58 Ha Giang
VM51 Ha Noi
VM59 Ha Tay
VM60 Ha Tinh
VM12 Hai Hung
VM13 Hai Phong
VM52 Ho Chi Minh
VM61 Hoa Binh
VM62 Khanh Hoa
VM47 Kien Giang
VM63 Kon Tum
VM22 Lai Chau
VM23 Lam Dong
VM39 Lang Son
VM64 Lao Cai
VM24 Long An
VM48 Minh Hai
VM65 Nam Ha
VM66 Nghe An

VM67 Ninh Binh
VM68 Ninh Thuan
VM69 Phu Yen
VM70 Quang Binh
VM29 Quang Nam-Da Nang
VM71 Quang Ngai
VM30 Quang Ninh
VM72 Quang Tri
VM73 Soc Trang
VM49 Song Be
VM32 Son La
VM33 Tay Ninh
VM35 Thai Binh
VM34 Thanh Hoa
VM74 Thua Thien
VM37 Tien Giang
VM75 Tra Vinh
VM76 Tuyen Quang
VM77 Vinh Long
VM50 Vinh Phu
VM78 Yen Bai

* VQ VIRGIN ISLANDS

WQ WAKE ISLAND

WF WALLIS AND FUTUNA

WE WEST BANK

WI WESTERN SAHARA

WS WESTERN SAMOA

WS01 A`ana
WS02 Aiga-i-le-Tai
WS03 Atua
WS04 Fa`asaleleaga
WS05 Gaga`emauga
WS07 Gagaifomauga
WS08 Palauli
WS09 Satupa`itea
WS10 Tuamasaga
WS06 Va`a-o-Fonoti
WS11 Vaisigano

YM YEMEN

YM01 Abyan
YM02 `Adan
YM07 Al Bayda'
YM08 Al Hudaydah

YM09 Al Jawf
YM03 Al Mahrah
YM10 Al Mahwit
YM11 Dhamar
YM04 Hadramawt
YM12 Hajjah
YM13 Ibb
YM06 Lahij
YM14 Ma'rib
YM05 Shabwah
YM15 Sa`dah
YM16 San`a'
YM17 Ta`izz

TW04 T'ai-wan

CG ZAIRE

CG01 Bandundu
CG08 Bas-Zaire
CG02 Equateur
CG09 Haut-Zaire
CG03 Kasai-Occidental
CG04 Kasai-Oriental
CG06 Kinshasa
CG07 Kivu
CG05 Shaba

G1ZA ZAMBIA

ZA02 Central
ZA08 Copperbelt
ZA03 Eastern
ZA04 Luapula
ZA09 Lusaka
ZA05 Northern
ZA06 North-Western
ZA07 Southern
ZA01 Western

ZI ZIMBABWE

ZI01 Manicaland
ZI03 Mashonaland Central
ZI04 Mashonaland East
ZI05 Mashonaland West
ZI06 Matabeleland North
ZI07 Matabeleland South
ZI02 Midlands
ZI08 Masvingo

TW TAIWAN

TW01 Fu-chien
TW02 Kao-hsiung
TW03 T'ai-pei

Appendix CC. AQUIRE Field Name Codes

<u>Field Name</u>	<u>Remark Abbreviation</u>	<u>Field Name</u>	<u>Remark Abbreviation</u>
Grade	GRADE	Exposure Type	TYPE
Purity	PURITY	Method Conc	CONC
Formulation	FO	Temperature	TEMP
Characteristics	CHAR	Hardness	HARD
Radiolabel	RADIO	Alkalinity	ALK
Carrier or Solvent	CARRIER	Dissolved Oxygen	DO
Solvent Grade	SOLVGRADE	pH	PH
Solvent Purity	SOLVPURITY	Salinity	SALIN
Solvent Formulation	SOLVFO	Conductivity	COND
Solvent Characteristics	SOLVCHAR	Organic C	ORG C
Media	FW,SW	Habitat Descr	HAB
Location	LAB,FIELD	Substrate Info	SUBSTR
Organism Char	LIFESTG	Water Depth	DEPTH
Control	CONTR	Location	LOC
Response Site	SITE	Sta/Pro/Country	NONE
Effect	In EE Remark	Latitude	LAT
Trend	TREND	Longitude	LONG
Endpt	In EE Remark	AP Type	AP TY
Measurement	In EE Remark	AP Frequency	AP FREQ
Signif	SIGNIF	AP Rate	AP RATE
Level	LEVEL	Half Life	HALF
Concentration	CONC	AP Season	AP SEAS
BCF	BCF	AP Date	AP DATE
Exposure Time	TIME		

Appendix DD. Terretox Field Name Codes

I. Quality Assurance Parameters

Field Name	Coding Sheet Abbreviation	Remarks Abbreviation
Reference Number	REF #, AUTHOR, YEAR	none
Total Tests	TOTAL TESTS	none
Reviewer/Date	REVIEWER, DATE	none
QA Date/Initials	QA DATE, INITIALS	none
TestNumber	TEST ID	none

II. Test Chemical Parameters

Field Name	Coding Sheet Abbreviation	Remarks Abbreviations
Chemical Name, Type	TEST, POSITIVE CONTROL, CARRIER	none, PC CARRIER
Grade	GRADE	GRADE
Purity	PURITY	none
Formulation	FORMULATION	FO
Comments	CHARACTERSTICS	CHAR
Radiolabel	RADIOLAB	RADIO
CAS number	CAS #	none

III. Test Information

Field Name	Coding Sheet Abbreviation	Remarks Abbreviations
Species Number/Latin Name	SPECIES #/LATIN NAME	none
Organism Source	ORG SOURCE	SOURCE
Lifestage/Age	LIFESTG/AGE	LIFESTG/ AGE
Organism Characteristics	ORG CHAR	OCHAR
Test Location	TEST LOCATION	LOC
Exposure Type	EXPO TYPE	TYPE
Control	CONTROL TYPE	CONTR
Number of Doses	DOSE NUM	DNUM
Application Frequency	APPL FREQUENCY	AP FREQ
Exposure Duration	EXPOSURE DURATION	ETIME
Study Duration	STUDY DURATION	STIME
Media Type	MEDIA TYPE	MEDIA
Soil Type	SOIL TYPE	SOIL
Soil Texture	SOIL TEXTURE	TEXTURE
Media pH	MEDIA PH	pH
Media Organic Matter	MEDIA ORGANIC MATTER	OM
Media Moisture	MEDIA MOISTURE	MOIST
Media CEC	MEDIA CEC	CEC
Soil Concentration Measured/ Concentration measured on Dry or Wet Basis	SOIL CONC MEASURED DRY-WET WEIGHT	none
Remarks	REMARKS	none
Experimental Design	---	EDES
Other Effects	none	OEF

IV. Exposure Information

Field Name	Coding Sheet Abbreviation	Remarks Abbreviation
Dose Number	DOSE NO	none
Dose ID	DOSE ID	none
Sample Number	N	none
Gender	SEX	SEX
Exposure Dose and Unit	DOSE/UNIT	DOSE/ DUNIT
Ion	ION	ION
Chemical Analysis Method	METHOD	ANALYSIS
Remark Number	RN	none
Remarks	REMARKS	none

V. Results Information

Field Name	Coding Sheet Abbreviation	Remarks Abbreviation
Dose Number/ID	DOSE NO/ID	none
Sample Number and Unit	N/UNIT	SAMPN/ NUNIT
Observation Time	O	OTIME
Effect	EFFECT	EFCT
Effect Measurement	MEASMENT	MSMT
Endpoint/Assigned	ENDPT/ASG	ENDPT
Result Set	R	none
Statistical Significance	SIG/NSIG	SIGNIF
Level	LEVEL	none
Paper/Reviewer Assigned Data	P R	none
Response Site	RESP SITE	RSITE
Observed Response Value/ Unit	OBSERV RESPONSE VALUE/UNIT	RVALUE RUNIT
Dry or Wet Weight	DW %	DW
Percent Lipid	%LIPID	LD
Remark Number	RN	none
Remarks	REMARKS	none

Appendix EE. Organic Matter Type and Units

Organic Matter Types

Code	Definition
ASH	Ash Free Dry Mass
C	Carbon
C:N	Carbon to Nitrogen Ratio
CPON	Carbon Particulate Organic Matter
Cox	Oxidized Carbon
DOC	Dissolved Organic Carbon
HUM	Humus
LOI	Loss On Ignition
N	Nitrogen
NR	Not Reported
OC	Organic Carbon
OM	Organic Matter
POC	Particulate Organic Carbon
POM	Particulate Organic Matter
TOC	Total Organic Carbon
peat	Peat

Organic Matter Units

Code	Definition
%	percent
NR	not reported
cmol/kg	centimoles per kilogram
g	grams
g/100g	grams per 100 grams
g/kg	grams per kilogram
mg/g soil	milligrams per gram soil
mg/100g soil	milligrams per 100 grams of soil
mg/kg soil	milligrams per kilogram soil
umol/g LIT	micromoles per gram litter

Appendix FF. Cation Exchange Capacity Units

Dose	Definition
NR	not reported
cmol/kg	centimoles per kilogram soil
cmol+/kg	centimoles + ions per kilogram soil
cmol P+/kg	centimoles P+ per kilogram soil
me/100g	milliequivalents per 100 grams s
meq	milliequivalents
meq A/100 g	milliequivalents NH ₄ per 100 g
meq mg/g	milliequivalent milligrams per g
meq/100g	milliequivalents per 100 grams s
meq/kg	milliequivalents per kilogram
mmol/100g	millimoles per 100 grams soil
mmol/kg	millimoles per kilogram soil
mmol K+/kg	millimoles K+ per kilogram soil
mval/100g	millival per 100 grams (mval=ppm*(ion charge)/(atomic weight))

Appendix GG. AQUIRE Concentration Types

Code	Description	Definition
Organic		
A	Active ingredient	Chemical substance in a product that is responsible for the pesticidal (toxic) effect (Ware, 1978). Reported as "A" when the author refers to the concentration as active ingredient, active principle or various grades of reagents (ie., Analytical, Reagent or Technical). When coding, a value in the publication may be reported as "AI kg/ha" or "kg AI/ha"; in AQUIRE this type of value is reported as 'A =' for <u>CONC TYPE</u> , with units as kg/ha. For example, 100 kg AI/ha is reported as A = 100 kg/ha.
F	Formulation	Way in which basic pesticide (toxicant) is prepared for practical use (Ware, 1978). Generally reserved for commercial preparation prior to actual use and does not include the final dilution (Insect-Pest Management and Control, 1971) (e.g.; Baythroid, 2,4-D). Also included in this category are organic compounds with no pesticidal activity (e.g.; PCB, dioxin).
Metal/Organometals		
D	Dissolved	Those constituents of an unacidified sample that pass through a 0.45 um membrane filter (e.g. soluble metal) (APHA et.al. 1992).
L	Labile	The labile or free ion metal concentration determined by various analytical methods. When coding, the specific labile forms or complexes are not differentiated

T	Total	The concentration of metals determined on an unfiltered sample after vigorous digestion, or the sum of the concentrations of metals in both dissolved and suspended fractions (APHA et.al. 1992). Heavy metals and single elements (e.g. Na, Cl, Br) are coded as T.
Code	Description	Definition
Inorganic non-metals		
T	Total	The dissociated, charged form of nitrogen or hydrogen related chemicals. This can take on numerous forms, e.g.; ammonium (NH ₄ ⁺), nitrite (NO ₂ ⁻), etc. (Rand and Petrocelli, 1985). T is the default for publications that do not state whether Total or Unionized concentrations are reported.
U	Unionized	The undissociated, uncharged form of ammonia or hydrogen sulfide. The ammonia molecule, NH ₃ , is the unionized form. (In aqueous solution, ammonia assumes an equilibrium between NH ₃ and NH ₄ ⁺ .) The NH ₃ is the toxic entity of the ammonia compound (Rand and Petrocelli, 1985).